

The Dental Digest.

Vol. IX.

CHICAGO, JULY, 1903.

No. 7.

Original Contributions.

THE PRINCIPAL MOLAR IN MAN, AND ITS RELATION TO AND BEARING UPON THE OTHER TEETH.

BY E. A. BOGUE, M. D., D. D. S., NEW YORK.

By principal molar I mean the first permanent molar, or what is often called the sixth-year molar. I call this the principal molar in deference to the expressions of famous anatomists more than one hundred years ago—Blainville, for example, who is much quoted by Owen. Furthermore, I find the name so appropriate in view of more modern discoveries that I think we would all do well to adopt it.

It gets its start soon after birth. Three to four years after the temporary teeth are all in position and in use this molar begins to make its appearance through the gum, generally at about the age of six years. As all present know, it erupts next back of the last temporary molar.

When these principal molars are nearly erupted an impression of all the teeth will indicate with almost absolute accuracy if there is to be any serious irregularity among the permanent teeth. This may appear strange and perhaps incomprehensible to those who have given the subject of dental dislocations little or no attention, but I think I shall demonstrate to your entire satisfaction the truth of my assertion. I am not purposing to tell you new things, but to recall to your attention old things that you know quite as well as I do.

First, then, this first permanent molar has five cusps in the lower jaw (though sometimes the fifth is but a rudimentary one) and four in the upper jaw. These cusps are of great consequence to the teeth from the very beginning. They assist in guiding the upper

and lower teeth to their proper positions relative to each other, and when these positions have been attained they assist in holding them there. If by any chance the teeth have assumed improper positions, and the cusps of the upper and lower teeth have interdigitated im-

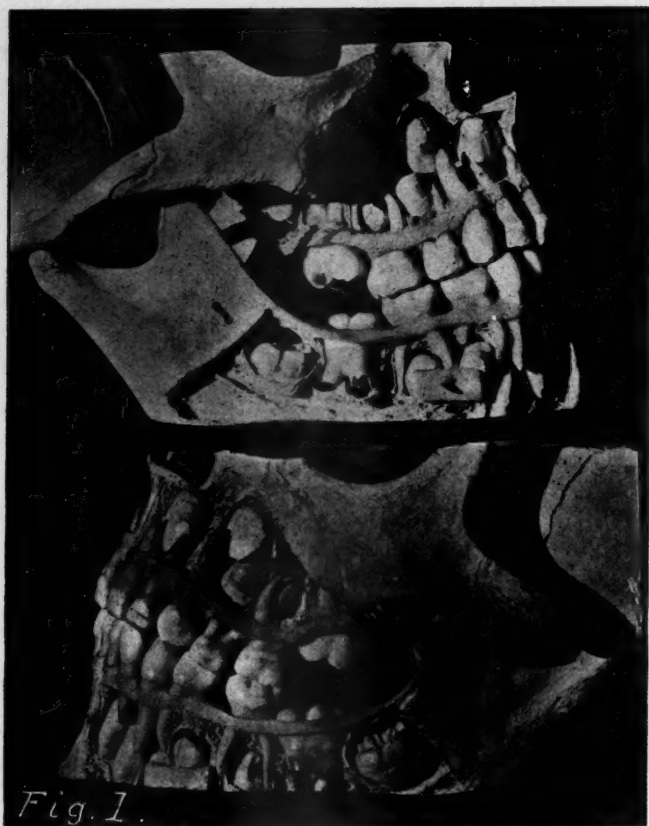


FIG. 1—A child's skull.

properly, they hold the teeth in their faulty positions just about as thoroughly.

As these four principal molars erupt, the lower ones being a little in advance of the upper in point of time, they should also be

one cusp in advance of the upper in point of position; that is to say, the upper molars should sit astride of the outer or buccal cusps of the lower molars, but just behind the anterior cusps.

We all know that just room enough is required between these molars and the cuspids for two bicuspsids. Therefore, if the proper occlusion of the molars fails there is bound to be an irregularity of some kind. If the upper molar is in advance of the lower there will not be room between that molar and the cuspid for the two bicuspsids, and we shall have either an irregularity of the cuspid or of one or both of the bicuspsids. If, on the other hand, the lower

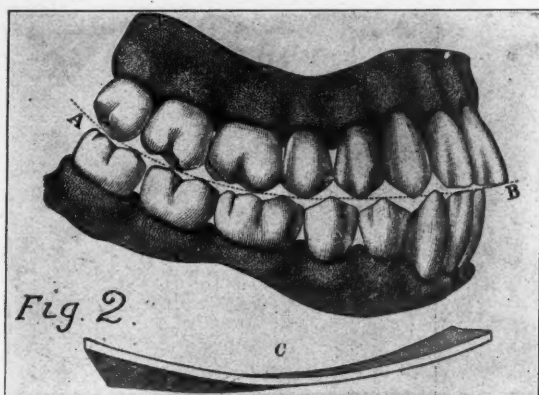


FIG. 2.—The horizon of the line of occlusion and plane of occlusion.

molar is too far in advance of the upper, the irregularity will be most manifest in the lower teeth.

I wish now to call your attention to Dr. Thompson's picture of a perfect denture, Fig. 2, which you will find in Kirk's "American Dentistry." You notice that the principal molar is almost exactly in the middle of the horizontal arch from the cuspid to the third molar, forming the very keystone of that arch, and being as regards regularity of the teeth the key to the situation. You will notice that the first molar, the second molar, and the third molar are three; that they are all first teeth notwithstanding they are also permanent teeth, that they all come into the row of teeth back of the temporary set, and that the additions to the skull, to the jaws, and to the alveoli of those jaws necessary to accommodate these teeth, all take

place between the time of the eruption of the first to the eruption of the third molar.

Thus we see that the growth necessary to the completion of the countenance, that growth which we say comes with increased years, that growth upon which depends so much the character of the mature face, is largely dependent upon the presence of these three molars for such development. Now turning to the forward lateral portion of the dental arch we find again three teeth, two bicuspid and the cuspid. These complete the line and the curve from before



FIG. 3—Hunter's page, 1771.

backward. Forward of the cuspid stand the two incisors, which complete the arches of the teeth.

Nearly all of the growth that has taken place in both the jaws since the eruption of the principal molar at about six years of age has taken place posteriorly to and above this molar. This growth has occurred in the interior of the skull; and leaves the anterior face of this molar as the middle of the dental arches.

In Fig. 4 we have in the lower model as nearly perfect a set of teeth, both in form and arrangement, as we often find. Not only are these teeth theoretically perfect in position, or nearly so, but I was not able to find the least trace of decay at any point. The lady to whom they belonged was probably about thirty years of age.

The upper model shows us a case in which the *upper* principal

molars developed a very little further forward than they should have done. The result is a slight prominence given to the cuspids, imparting to one of the mildest and gentlest of faces a sort of fierce look when the person shows the teeth. There is also a depression at the incisal region that accentuates still further the prominent cuspids.

The principal molar is indeed the keystone of the dental arch, and



when it is realized that every member of that arch is of a size exactly appropriate to the arch, it is seen that any variation in the position of this keystone causes a variation in the entire arch.

Dr. Talbot in his "Irregularities of the Teeth," 4th Edition, Page 63, says: "If the teeth antagonize uniformly the arch will enlarge around evenly. If the molars are fixed the alveolar process will expand anteriorly." Also, "The position and shape of the processes and their relation to each other are governed entirely by the shape

and size of the teeth and roots and not by the shape of the jaw-bone proper."

Please understand that I have no quarrel with the doctrine of development. On the contrary, I recognize therein the Creator's method of creation, but I have a very decided objection to the doctrine that a six-foot Irish father, strong and vigorous, can give his teeth to the jaw of a five-foot French mother, frail and thin, and can combine these two qualities in the progeny of those two parents. That is not the way nature works, and for us to attempt to evade our responsibility as scientific men, practicing for the children a calling that has much to do with all their future lives, both as



regards health and appearance and powers of expression, whether vocally or by nobility of countenance, is beneath our dignity as members of one of the learned professions.

When Nature builds a set of teeth she builds a jaw to correspond, and if that jaw comes to maturity, and the teeth are developed and find their proper positions along nature's lines without accident or improper meddling, it will be found that not only is the jaw large enough for the teeth, but also that under these conditions whatever facilities the natural and proper development of that jaw and the natural and proper placing of those teeth into the most perfect dental arches also facilitates the development of the facial and other

bones. The ethmoid, sphenoid and palate bones as well have developed nicely, and the sense of hearing and smelling and the power of mastication, as well as enunciation, are all promoted by this normal dental arch development.

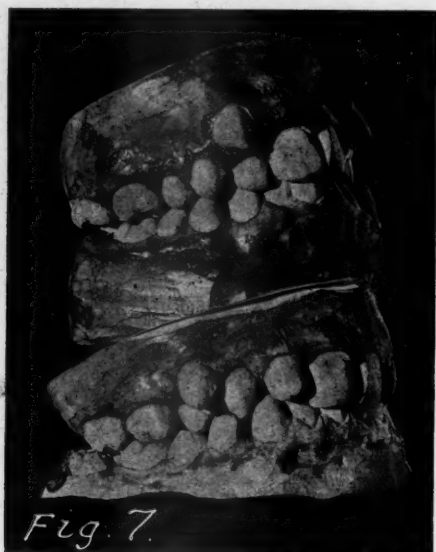
In order to guide the teeth in their development into proper positions it is evident that it is necessary to know precisely what those proper and natural positions are. Hence it is necessary for us to study carefully the arrangement of a good many sets of thirty-two



natural teeth. There is of course no absolutely perfect and typical set of teeth, any more than any perfect part of the body. We should study these complete sets from a period pretty well along in life, when the teeth will have suffered the wear and tear of forty years or more, and thence backward through the various stages of accident and development to the very beginning. Upon such a study as this will depend our ability to guide and to preserve in good order the teeth of our patients from infancy to old age. If we do anything to disturb the natural ideal position of the teeth we

interfere with nature's process of arrangement as well as with that of self-cleansing. If we interfere with the cleansing we promote decay, for a clean tooth never decays, and when we permit the teeth to go astray because of what we call accidental circumstances that occur during the processes of formation and development of the permanent teeth we contribute to their loss.

We will now follow through a few cases illustrating certain conditions that are frequently found in practice. This model, Fig. 5, shows the first permanent molars above and below in perfect occlu-



sion, and presupposes room enough forward of these teeth for all the remaining ones to erupt with perfect regularity.

These models, Fig. 6, both show in a marked degree the important office of the principal molars, as just shown in the previous model, to sustain the jaws during the shedding of the temporary teeth and their replacement by the permanent ones.

The lower model shows the irregularity produced by lack of room, owing to a dislocation of the upper molar. Imagine what would happen to these jaws were the principal molars to be ex-

tracted at this age—about ten years. Please remember that an amputation or an extraction is no cure for a dislocation of any member. It is only an evasion of the difficulty, and a substitution of one of our mistakes for a mistake of Nature's, to the greater detriment of the patient.

These two cases, Fig. 7, exemplify a condition of the principal upper molar that is not quite accurate, and would a priori indicate



an irregularity of the molar and bicuspid teeth, and possibly of the cuspids, owing to the upper principal molar being one cusp in advance of where it should be. As a fact you see that the cuspid in one case and the biscuspid in the other have erupted out of their proper places and are unable to take same in the arch, because the upper molar is too far forward and does not leave enough room for the other permanent teeth in front of the upper molars, hence we find in each case a tooth crowded out of position.

Dr. A. Hrdlicka, Curator of Physical Anthropology in the National Museum at Washington, Smithsonian Institute, to whom I am



indebted for a number of suggestions which have increased the accuracy of this paper, says: "It is probable that the somewhat

more anterior position of the molar, as well as that of one or both of the bicuspid, is secondary and the effect of a too early shedding of the posterior premolar, or a delay in the eruption of the cuspid. Hence it may be better, by all means safer, to say the principal molar *assumed* a wrong position, not erupted in such."

These two cases, Fig. 8, represent the position of the lower principal molar forward of where it ought to be, and a consequent diminution of room in the lower jaw, with the effect of throwing



the somewhat belated first bicuspid far out of line in the upper model, while the cuspid is rotated upon itself and thrown inward. In the lower model the impulse forward has been extended to the cuspid and incisors, giving the young lady a somewhat square, unseemly appearance in the front part of the lower jaw.

The next models, Figs. 9 and 10, show the dentures of a boy eight years old in May, 1900. They exhibit the left upper molar somewhat more than a cusp in advance of where it should be

relative to the lower molar. In this case the second upper temporary molar had fallen out of its own accord much too early, and the permanent upper molar was found in the position which it occupies on the model when this impression was taken. A fixture was put on to press this molar back to place. About that time the bicuspid began to erupt and presented the appearance shown in Figs. 11 and 12. After I succeeded in getting the molar back to its proper position, the bicuspid on either side of the mouth were easily drawn into their places in about ten days. Retaining plates were kept in position until the cusping of the upper and lower teeth with each other was sufficient to hold them in place, so that the heavy pressure



exerted by the tongue on the inside, and lighter but continuous pressure of lips and cheeks on the outside completed the oblong form of the two arches, and the result is what we see in the models of the finished case, Figs. 13 and 14. Fig. 15 contrasts the two models, before and after the operations for correcting the malocclusion.

The point to which your attention has been especially though indirectly called during all this description is, that the removal of one or more teeth from either of the dental arches does not and cannot correct any irregularity of any kind, *nor does it aid in correcting such irregularity.* I beg your careful consideration of this

statement. I can conceive of cases of irregularity having been neglected until maturity that might be somewhat benefited by the removal of one tooth, although a certain amount of injury would also be inflicted, but I cannot conceive of any case where the extraction of four teeth could ever be of sufficient benefit to compensate for the extra mischief done, nor is it ever good practice to extract



permanent teeth from children or young persons. All necessary corrections of irregularities can be done more promptly and more easily for young people with all the teeth in place.

When this cusping of the upper with the lower teeth is carefully considered it is recognized that the loss of even as much material as would be removed by a thin file passed between two teeth works a damage difficult if not impossible to wholly repair. On the other

hand, teeth that are irregularly situated, that is, dis-located, submit to being drawn into their proper places with the remaining teeth all in position to assist in holding them here much more readily than they submit to be pulled into places where they did not originally belong. In the former case the alveolus bends a good deal, submits to absorption somewhat, and the teeth are brought into their proper arches and their proper contact with each other and are held by natural forces, prominent among which is their proper cusping with the antagonizing teeth of the opposite jaw. In the latter case, when teeth have been extracted to be regulated, the

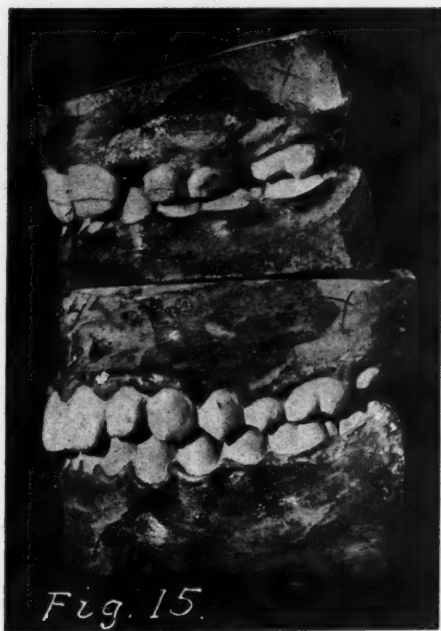


teeth are forced against a wall of alveolus that was designed to hold them for life. The force required and the time consumed to draw them into improper positions is so much greater than would have been required had all the teeth remained in their proper relations with each other, that from two to three years are frequently consumed in obtaining only a fair condition of regularity, with no proper occlusion at all and no possibility of properly grinding the food which is taken.

I now call your attention to the crowning lesson which we may draw from all that has preceded. We may at about seven years of age, perhaps even sooner than that, accurately foretell whether or not any irregularity is impending among the molar and bicuspid

teeth of a child. And we may, as soon as the first molars are developed enough to attach rings to them, or sometimes to tie a wedge between them and the temporary molars, correct such irregularities surely and painlessly.

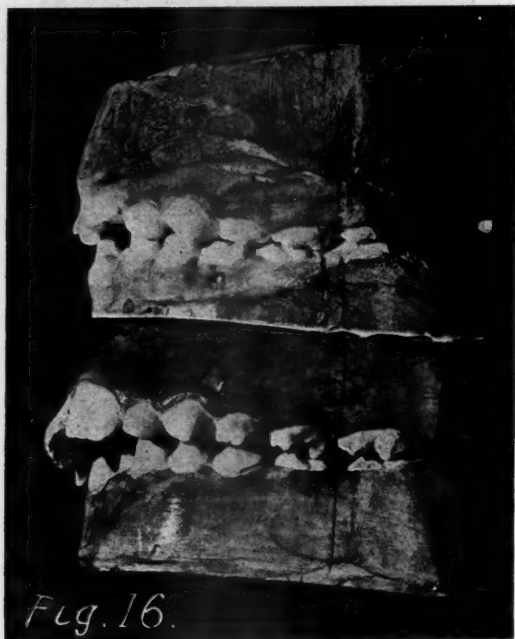
The upper model here exhibited, Fig. 16, shows the mouth at six years of age with the first permanent molars erupted and slightly



in contact, occupying their normal position, namely, the lower molar one cusp in advance of the upper. The temporary teeth are in their places, and there is nothing especially noticeable, certainly nothing requiring attention among the teeth. Ten months later the lower model was taken. Here we find the upper molar has advanced one cusp forward of the position it ought to occupy. The four temporary teeth above and below are still in place, but the upper ones have been pushed forward of the position which they occupied

ten months previously. The permanent central incisors have erupted and stand at a V-shaped angle, nearly if not quite three-eighths of an inch forward of where they should be. Now the question arises, how did this extreme prognathism of the upper jaw take place in so short a time, and why, and what should be done to correct it, and when?

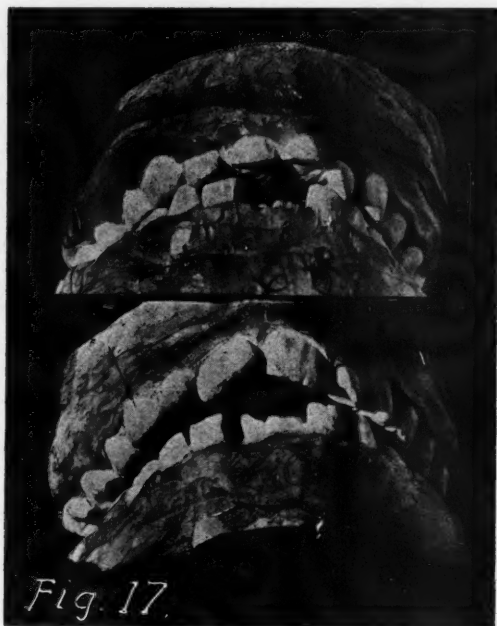
Fig. 17 is the front view of the same mouth, and taken at the



same dates as the previous slide, showing very clearly the good occlusion of the temporary teeth previous to the growth of the permanent molars and the malocclusion of these same teeth when the permanent molars finally erupted to the length shown in the picture.

These models show to me a mouth-breather, and they also show a slight diminution of width in the region of the cuspids,

which made it disagreeable for the child to close the teeth naturally, so she acquired the habit of closing to one side to get rest. During this period the permanent molars grew down and failed of proper occlusion with the lower ones, and so acquired a position in advance of what they should have had. Unless corrected this will surely cause irregularity among the teeth forward of these molars, because



of insufficient room for them to erupt into their proper positions.

My own conviction is, and has been for some time, that if the principal molars can be gotten into their proper relative positions at or shortly after the time of their eruption no serious irregularity will ever occur to any of the grinding teeth. Irregularities arising in the incisal region are extremely easy of correction providing the principal molars are in their proper positions.

PRESIDENT'S ANNUAL ADDRESS.

BY A. H. PECK, M. D., D. D. S., CHICAGO. READ BEFORE THE ILLINOIS STATE DENTAL SOCIETY, AT BLOOMINGTON, MAY 12-14, 1903.

Gentlemen of the Illinois State Dental Society: Permit me to express my keen appreciation of the honor which you have conferred upon me. The honor lies not alone in the office to which you invited me one year ago, for the position owes its significance to the character and standing of this organization. For thirty-eight years we have been making history, and as we pause for a moment to-day to look back upon that which has been accomplished, it is with pardonable pride that we point to the record which has been made. The honorable position which we hold among kindred associations is not the result of chance. High ethical standards, a persistent purpose to realize the best in professional life, careful and painstaking preparation of the papers that have been presented from time to time, conscientious performance of official duties—these are the things that have made this organization what it is, and have given to it a place of influence and power.

I do not come to you to-day with any new message, or to discover to you a hitherto unknown method of procedure. The technical side of our professional life has been discussed from year to year in papers of marked ability, and the present session will add to the valuable literature upon special subjects connected with our work, which has been steadily growing for almost four decades. In view of the close attention given to the purely professional side of our work, I may be pardoned if at this time I call attention to essential principles, and seek to increase and deepen the intelligent convictions out of which has issued the best prosperity which has marked the history of this society.

Thoughtfulness is the advance guard of all worthy accomplishment. Lying back of all the great work of man's hands is the thought of man's brain. The impulse to all the moral reforms that have purified and blessed society has been found in the moral purposes of human hearts. The picture which holds us enthralled by its beauty took shape in the brain of the artist long before it was made to glow upon the canvas. This union of states forming the mightiest nation of the world was a dream in the minds of Adams and Jefferson before it became a reality. If we are to advance as

individuals and as a society, it will be only as we first of all come to a clear perception of what we ought to be and do. It is said of Tissot, the famous French artist, that the impulse to the work which has made him immortal came from a vision. He had painted for years with indifferent success. Sitting one day in the Church of the Madeleine in Paris he saw—perhaps in a waking dream—the form of Jesus Christ standing by the side of two poor peasants, an aged husband and wife, encouraging them in their deep dejection. He went out from the stately church with a new purpose, born of this significant vision. That purpose found its expression in a series of paintings representing scenes in the life of our Lord; paintings of such beauty and power that they have commanded the admiration of the world.

If we accomplish anything worth while, if our work is to be of such quality that it shall contribute to the advancement of our profession and the well-being of society, it will be because we have set before ourselves clearly defined and worthy ends, to the accomplishment of which we give ourselves with unfailing devotion. What, then, shall be our ideals? What vision shall stir our hearts and incite us to wisely directed effort? As we ask ourselves these questions and seek their answer, our thoughts instinctively turn first of all to the profession of which we are members. Because we love the profession to which we have dedicated our lives, we will guard jealously its good name. Shakespeare made Juliet ask, "What's in a name?" It matters little whether we be called John or Samuel; but when name means reputation, when it stands for honor or dishonor, 'tis a thing for which to do battle. Eternal vigilance is not only the price of peace, but of reputation as well. Charlatans are to be found in every walk of life. In every community and in every time exist men whose chief aim seems to be to reap where others have sowed. Because our profession has won an honorable place for itself through the important service which it renders, we must expect that dishonest men will try to trade upon our good name.

At whatever cost, in time and toil and money, we must protect our profession against the attacks made by men who conduct illegal institutions, so-called dental schools, which exist not to furnish training but to sell lying diplomas. All praise is due to our State Board, and to the Chairman of the Prosecuting Committee

appointed by the National Dental Association, for their relentless prosecution of the unprincipled owners of these diploma mills. Much has been accomplished, but much remains to be done. We need still better laws, and the more rigorous enforcement of laws already upon the statute books. Let us not flatter ourselves that the battle against dishonesty has been won. We have gained victories, but our enemies are expert at bushwhacking, and as we drive them from one cover they seek another. If they are cunning, let us be tireless. If they dodge us to-day, we will run them to earth to-morrow. They may escape us for a season, but sooner or later we will bring them to the bar of judgment and visit upon them the just penalty of their crimes. By securing the enactment of suitable laws, and by their tireless enforcement, we will drive these thieves out of business, as has been demonstrated, and make it impossible for any man to gain a diploma except by actual work.

It is a matter for great congratulation that a meritorious dental law has been enacted during the recent meeting of the Legislature. If the Governor does not veto this bill, one provision which it contains—that the State Society shall name three of the five members of the Board of Examiners—insures to the state clean, honest methods in the administration of the Board's affairs. Too much praise cannot be bestowed upon those who have given their time and energy and money in their endeavor to secure the enactment of this law.

But the reputation of our profession is not menaced alone by those who stand without. No foes are so to be dreaded as those of our own household. We can defend our castle against assaults from open enemies, but how shall we successfully resist the disloyalty of those who are within our walls? There is no perfect human organization. Even the Christian Church is made the hiding-place for some whose aims are selfish and whose lives are unworthy. We cannot expect that our Society will be an exception to an otherwise universal rule, but we need to place before ourselves high standards and strive to measure up to them. It is said of the Athenians that they did nothing else than either "to hear or to tell some new thing." There are men to-day in our own profession who seem to do nothing else than to hear or to tell something derogatory to the character of their fellow practitioners. What they do not say by bold declaration they insinuate by shrugs and

winks and innuendos. No jealousies are more bitter and implacable than those found among professional men. You may say that jealousy is the sure sign of a small soul, and so it is; but even the small insect may cause great irritation and unhappiness. When you see a man spending his time in vicious gossip, trying to find out something to the discredit of his fellow, manufacturing when he cannot discover that which he seeks, gloating over human imperfection, and rejoicing in exposing it to the world, you have found a man who, in the words of Ben Jonson, "Cuts men's throats with whisperings." What can be done to silence slanderous tongues and suppress unprincipled gossip-mongers? Refuse to listen. Give them to understand that you consider the tale-bearer worse by far than the one about whom the tale is told. Deny to them the delight of using you as a sewer into which they pour their filth. The gossip understands that his occupation is gone when all ears are closed to his tales. So shall we help to abolish an evil that not only brings unhappiness to many worthy men, but seriously affects the fair fame of the calling which we profess to love.

During the last few years the courses of study in our professional schools have been extended, broadened and perfected to a degree that is gratifying in the extreme. Beginning with the next scholastic year, four years will be required to complete the course of study, instead of three as heretofore. It is the conviction of some that it would have been wiser to increase the entrance requirements rather than to lengthen the course in the professional school. Concerning this honest and intelligent men will differ, but all are agreed that the standards of dental education must be high enough to make it impossible for any lazy man or any incompetent man to secure a diploma; high enough to lift our profession to the loftiest possible plane of intelligence and efficiency. We can have no sympathy with the reactionary utterances recently promulgated by a Chicago business-man, in which he maintains that a college training not only fails to benefit a young man, but inflicts upon him a positive and serious injury. That man was born too late. He belongs in the darkness and ignorance of the middle ages. He considers education solely with reference to its helpfulness in money-getting; a view of education and of life so low and selfish that we need spend no time in exposing its fallacy. I have heard of an organization with the motto, "The best is good enough for

us." That should be the motto of those who are preparing themselves to enter our profession. Thorough training, wide reading, and high intelligence are valuable assets to every man who would make of life something more than mere existence.

Let me say a word as to our individual professional work. It may seem to us that only personal success hangs upon our industry and skill, but we are to remember that the standing of our profession is but the sum total of individual standing. Every good piece of work, every original investigation, every valuable achievement, is much more than a personal triumph—it is a distinct contribution to our profession. As we labor let us not forget that back of pecuniary reward, and even of the satisfaction found in the alleviation of pain, lies the service which we render to the profession that we honor and the interests of which we delight to conserve.

May I turn now from professional to civic life and ask what are our ideals as citizens? Do we have any? Does the constraint of duty, obligation to serve, rest upon us only as we stand related to professional activity? If so we are culpably derelict, and that is just the indictment that must be returned against multitudes of professional men to-day. This country is leading the world in many lines of activity. We have become the world's granary, and are fast becoming the world's workshop. European nations envy if they do not hate us. They send their commissions to study our methods and to discover if possible the secret of our prosperity. All this is very gratifying to our pride, and we have a right to felicitate ourselves upon the vast strides that we have made in commerce and manufactures during the last decade. But however much we may glory in our business prosperity and unparalleled power, no thoughtful man can ignore conditions in national and civic life which afford cause for apprehension.

No nation ever had such strain put upon her as that under which we labor because of immigration. It will not do, with happy optimism, to assume that the great masses of illiteracy which are being taken into our national body each year, will be assimilated easily and unconsciously. Great numbers of these immigrants are to-day, after years of residence among us, almost as unaffected by American life and thought as they were when in their native lands. They are not easily susceptible to the influence of environment. If

they come to be American in anything more than name it will be through the persistent effort of the intelligent element in our national life. This ignorant and undigested mass soon learns one important function—that of voting. Without any conception of the real meaning of free institutions, or the power and value of the franchise, they are manipulated by ward bosses and their votes become the steps on which unworthy and vicious men climb into positions of power. No good man can look upon existing political conditions without shame for the present and fear for the future. In many of our large cities men who are not only vicious and depraved, but criminal as well, are put into places of trust by the votes of those who know no more of government than do the cattle in the fields. The revelations in Minneapolis and St. Louis, to say nothing of other great cities, brings a blush of shame to the cheeks of every honest man.

What have we to do with all this, do you ask? We have our duty as citizens. We owe something to the communities in which we live, to the state, to the nation. No man has a right to receive and enjoy the protection which the state affords, and pay back nothing but money in the shape of taxes. Good citizenship involves self-devotion to the highest interests of the commonwealth. Public abuses thrive only where the people are indifferent. In any square fight between the forces of honesty and dishonesty the former will be found in a large majority. There are more good people than bad; more who desire the honest administration of good laws than there are of those who seek to violate law or have it annulled. Why is it that so often the wicked prosper and rogues grasp the power in their unclean hands? Is it not because good men neglect civic duty and leave political affairs in the hands of the spoilers?

I am not pleading that the men of our own or of any other profession shall leave the life-work which they have chosen and enter into a scramble for office—anything but that. Woodrow Wilson in a recent address very wisely remarked that what this country needs is politicians who are not seeking office. We need men who, with no itching for official position, will bring to political activity a high sense of responsibility and a constancy of devotion. When things become too unspeakably vile we raise the cry, "Turn the rascals out," and proceed to clean house. The interest and activity evoked spasmodically as a remedial agent should be exer-

cised all of the time as a preventive. It is far easier to keep the rascals from getting in than it is to oust them when firmly entrenched. If any member of society has upon him obligation to the commonwealth it is the professional man. He is above the average in mental training, and his position in the community leads his fellow-citizens to regard him with respect and give careful consideration to his opinions. His position carries with it obligation. He is recreant to duty if he fails to use his influence to actively promote the best interests of the commonwealth. We do well to seek for the creation and enforcement of laws which are for the good of our profession, but we ought also to stand back of every law which is for the restraint of evil and the promotion of good. It is our high privilege to have a part in shaping the civilization of the greatest nation that God's sun shines upon. We have our homes in this great Mississippi Valley, the possibilities of which the most daring prophet of our country's greatness has not yet realized. In this vast inland empire are to be wrought out problems of government which will demand for their solution the highest wisdom and the most unselfish devotion of our best citizens. In the pressure of other and weighty duties let us not forget that of good citizenship.

May I presume still further upon your patience, while I suggest that we ought to be apostles of beauty as well as of utility. We are a practical people, largely devoted to business and the promotion of that which we call useful. Let us not fancy that the beautiful has no mission in the life of the community. We cannot yet compete in art with the nations of the old world which the centuries have enriched, but we can aspire and strive. Noble architecture, clean streets, parks, libraries, museums, these have their important place and their high function. Let it be ours to lend a hand to every movement which seeks to cultivate the love of the beautiful, or to furnish the public with those agencies which tend to broaden and enrich the life of the people.

Let us now come a little closer to the individual, and ask ourselves what our ideal of manhood shall be. This each must answer for himself, and on the answer hang not only the issues of the individual life but the welfare of society. There is not a question which concerns professional life, the future of this organization, or the perpetuation of republican institutions, that does not hinge upon

the individual and his conception of life. As we emphasize the importance of right character, I would recall to your minds the words of Daniel Webster: "If we work in marble, it will perish; if we work in brass, time will efface it; if we erect temples, they will crumble into dust; but if we work on the immortal mind, if we imbue it with correct principles, the fear of God and the love of our fellowman, we engrave on those tablets something which will brighten with all eternity." We are each engaged in a work that is more important than any purely professional activity; a work in which success or failure takes on infinite importance; the work of building character.

It is easy to admire the admirable but difficult to embody it. A sturdy, pure, honest and gracious life never comes save through effort. We sometimes imagine that the deed is done when we see the noble and good and wish that they might be ours. Somewhere I have read this fugitive verse:

"Scatter thy wishes, and their arrows fall,

"Broken and spent, before Fate's frowning wall.

"Forge from their fragments one sharp spear of will;

"The barriers frown, but thou shalt pierce them still."

At the center of life *will* sits upon the throne. As we will so we are. Castles-in-Spain, day-dreams, may bring us momentary joy, but they crumble into dust if they are not buttressed by the imperial strength of dauntless purpose. It is well to have high ambitions as members of an honorable profession. Far be it from me to speak any word which should discourage any member of this Society in the pursuit of the highest excellence in the special line of work which he has chosen, but the fruit of success will turn to ashes in our mouths if we lose manhood in the struggle for professional fame.

In an open letter, written by Marshall Field to a friend, he expresses this sentiment: "There is no money success that can compensate for the loss of character." Let not the glitter of tinsel blind us to that which has intrinsic value. We may look out with wondering and possibly envious eyes upon the meteoric and brilliant display of some whose magical rise and progress command the attention of the community. It may be that their success stirs our hearts with a strong impulse to duplicate their experience; to try our hand at dazzling our fellows by feats of financial legerdemain.

If prosperity comes to us in the honest pursuit of our life-work, well and good. Money is not to be despised, for it may be used to relieve distress and to increase the world's happiness. But there is a wealth which is within the reach of every man, a wealth that cannot be measured in terms of currency—that of an unselfish, honest, noble character. To give such a life to the world in which we live, to leave such an influence after we have passed away, is to realize the truest success and make the largest possible contribution to the well-being of our fellowmen. May these high ideals inspire and lead us. May we be so loyal to all that is best in manhood and professionalism that Shakespeare's immortal words will be true of every one in this presence:

"His words are bonds, his oaths are oracles;

"His love sincere, his thoughts immaculate;

"His heart as far from fraud as Heaven from earth."

Discussion. *Dr. G. V. Black, Chicago:* I most heartily approve of this paper, but there is one axiom in it to which I would object, namely, "The best is good enough for me." I want something better tomorrow, and this should be the sentiment of the profession. Dentistry will be judged not by its best men nor by its poorest, but by the average dentist, according to the impression he makes upon the community in which he lives.

I have thought a good deal about this matter of education. Of course we do not want every applicant to be licensed to practice, although it is not so important if a few ignorant men happen to get through. The question is, what is the preparation of the average dentist? Is he sufficiently informed and skilled for his work? Is he sufficiently impressed with the duties he owes to civilization and to the community in which he lives, and is he prepared to lead a life that will reflect credit upon his profession? A man may be well versed in pathology, in instrumentation, in operative procedures, etc., but he may not have the character that will impress his community. We need good men who will make their mark as citizens and gentlemen as well as dentists.

Dentistry is a vocation, but every one should have an avocation as well. It may be of a social, political, or scientific nature—I don't care if it is only classifying grasshoppers—do it well and it will be an honorable pursuit. These avocations have as much to do with

the reputation of a dentist as his vocation, and receive as much consideration from his neighbors.

I am gratified to see so many present, but how few there are compared to the number of dentists in the state. The dentists of Illinois are not organized as they should be, and during the last three or four days the fact has been forcibly brought to our attention in connection with the new dental bill. The physicians of the state and country have done a great deal in the way of organization during the last three or four years, but the dentists have done almost nothing. We should be able to secure the aid of every licensed practitioner in the state in an emergency like the one which now confronts us.

Dr. C. B. Rohland, Alton: A man with high moral ideals, even if his professional ability is not so great as that of some others, is a safer man and a better practitioner than he without such ideals. I would rather trust my family to a man of mediocre ability but undoubted integrity than to a brilliant knave. There are men in all professions whose ideals are not elevated, and they will not give good service, no matter what their abilities may be.

Dr. Edmund Noyes, Chicago: It is quite true, as Dr. Peck states, that a picture exists as an ideal in the imagination of the painter before it is transferred to the canvas, but the successful artist has a mind so plastic that his ideal will expand and be corrected continually by the appearance of the completed portion of his work. The same is true of character, for the foundation is built by means of the quality of the superstructure. We must have men who are so true to their principles and ideals that they can cling to them tenaciously, yet are so clear-sighted and fair-minded that they can modify them to meet the needs of the situation.

The essayist referred to the fact that our educational standards are to be advanced from now on, and that one year is to be added to the course of study in dentistry. Some of us, of which I am one, would have preferred that the entrance requirements should first be advanced, so that we might have young men better fitted to take advantage of a four years' course before requiring it of them. You have all observed the disposition to make a part of the general college course count in the professional college course, so that young men will not be too old when they are ready to go to work. If this new development or fashion has the result of inducing a larger number of young men to think they can afford a college education before

studying dentistry it will be greatly to our advantage. A very considerable number of college men are to be found in the professions of medicine and law, but there are very few in dentistry. We greatly need more of them, for it is undeniable that the college men do far more than others in proportion to their number for the advancement, usefulness and reputation of any profession in which they are found. Furthermore, boys who have just graduated from the high school are often too young for the severe scientific training that the dental school ought to give them. By the time a man is ready to practice dentistry he should be of mature age and development, and it is time for us to ask that the young men who come to the dental colleges shall have some fitness to do the intellectual work required to make professional men of them.

Dr. C. R. Taylor, Streator: As regards this question of the colleges, the standard of training has been raised by changing the course from three to four years, but what is being done with the ethical training and the college ethics? Unless ethics and culture go hand in hand with intellectual attainments our colleges will produce a lot of unethical and unprofessional money-makers. During the past year I received several postal cards from deans of dental colleges asking for, "The names of persons thinking of studying dentistry," and I wondered if those deans or any men connected with those colleges would think it ethical for them personally as practitioners to send out postal cards asking for patients. Any reason that may be assigned for the colleges doing such things can with equal force be assigned for their students doing similar things when they enter practice. I would say to the deans of dental colleges—raise the standard of your ethics so that when young men leave your doors they will be a credit to you and your profession.

Dr. Don M. Gallie, Chicago: I wish to compliment Dr. Peck on his excellent address. I was especially interested when he referred to our neglect of our duty as citizens. That fact was never more impressed on me than during the past six months while we have been working for better legislation in dental affairs. When we started we found that only about ten per cent of the dentists in the state knew anything concerning existing conditions in dental legislation and affairs, and not over ten per cent knew the name of the man who represented their district in the Legislature. A copy of the new bill was sent to every dentist in the state by Senator Clark and

also by the DENTAL DIGEST, both with the request that the dentists would write their representatives to vote favorably on the bill. The matter was also brought to the attention of the profession by the dental journals of the state, and at the Clinic of the Odontographic Society in February every resident dentist present was requested to do something. In spite of all this, when the various members of the Legislature were asked whether the dentists in their district had seen or written them about the bill they invariably said, "No, we have not heard from or been seen by any dentist." You can understand how hard it is to accomplish anything in the way of legislation on behalf of the profession when the members thereof are so negligent, careless and indifferent in the matter of state affairs and their duties as citizens.

We believe this is the best state dental society in the country, but less than one-tenth of the men in the state belong to it. When the members of the Legislature learned this, and that the state society was not a representative organization, they did not feel that it should have the right to name three members of the Board. I telegraphed and wrote men in various parts of the state to see their representatives and do the best they could on behalf of the dental bill, and on looking up members of the state society I found that in some of the larger cities not a dentist belonged. This condition of affairs exists in every state in the union, but that is no excuse for Illinois. We must devise some plan whereby this society can gain enough members to command some respect, and show that it is made up of the best element of the profession.

As regards preliminary education, I would warn the colleges and those who are so persistent about the matter that they must go very carefully, because in their zeal they may do more harm than good. If the standard is raised too high there will be legislation against it. An amendment to the bill was promulgated this year by institutions that are not what they should be, and as it was backed by some of the strongest politicians in the state a great amount of work was required to kill it. Our preliminary education should be higher than it is, but not so high as to arouse antagonism.

Dr. C. N. Johnson, Chicago: Let me first congratulate our president on the learned address he has given us. Dr. Gallie referred to "legislation on behalf of the profession." I should like to have it emphasized by this society that any legislation aimed at in the bill

referred to is not in the interests of the dentists but for the benefit of the people of the state. We should go to Springfield on this basis and demand legislation, not plead for it. We have no right to ask for legislation that is in the interest of the profession only, but we can with justice ask of our representatives that they pass laws which will protect the people of the state.

Dr. B. J. Cigrand, Chicago: Dr. Peck's paper is a sermon in the strongest sense of the word. It is a guide to good moral conduct, and for that reason is timely and will go down into history as one of the cleanest and best expositions of ethical living we possess. It deals with an important thing when it says that the dentist who neglects his citizenship is shirking a great part of his duty. Any man who practices dentistry for the commercial side alone is not worthy of his degree. This society should not only increase its numbers, but the members thereof should stand as one man to prosecute impostors and shysters who bring our calling into disrepute. It is a disgrace that so great a profession as this goes before the Legislature and has no influence.

RECOGNITION OF THE D. D. S. DEGREE BY THE AMERICAN MEDICAL ASSOCIATION.

BY EUGENE S. TALBOT, D. D. S., M. D., CHICAGO.

It will be of interest to the dental profession to know that the American Medical Association has recognized the degree of D. D. S. One object of establishment of the Section on Stomatology in the American Medical Association was to try to place dentistry on an equal standard with other specialties in medicine. The members of the Section have labored many years with this idea for a goal, and members of the Association have been the warmest friends from the beginning.

The members of the Section have as their battle cry, "By their works ye shall know them," and for each meeting a program has been prepared far above that of the average dental society. Subjects have always been chosen of mutual interest to physicians and dentists, to the exclusion of dental technique, since there are many dental societies in which subjects pertaining to dentistry proper are discussed.

When the Section was first organized only those holding the

M. D. degree could become members, but in June, 1887, Dr. N. S. Davis, Dr. W. W. Allport and I drew up the following:

"Resolved, That the regular graduates of such dental and oral schools and colleges as require of their students a standard of preliminary or general education and a term of professional study equal to the best class of the medical colleges of this country, and embrace in their curriculum all the fundamental branches of medicine, differing by substituting practical and clinical instruction in dental and oral medicine and surgery, be recognized as members of the regular profession of medicine, and be eligible to membership in this Association on the same conditions and subject to the same regulations as other members."

While this practically recognized the D. D. S. degree, yet the wording of this resolution was so ambiguous that every year the officers of the Section had more or less trouble in admitting members. Thus at Denver, for some reason unknown to the writer, an edict was issued before the meeting that only M. D.'s could become members, and some thirty members were lost to the Association. This was unintentional, as it was admitted to have been a mistake by the Secretary and Treasurer after the meeting.

The Section drifted along under the resolution until 1901, when a new constitution and by-laws were adopted which placed our Section at a greater disadvantage. In the meantime the Section by the character of its papers and discussions has placed itself upon an equal standard with other Sections. Nay, more, it has in some respects far surpassed the other Sections. It has been frequently cited in the past ten years as a model which other Sections, to be successful, might copy, as witness the following remarks by President Billings at New Orleans: "One of the best conducted Sections of the Association is that of Stomatology. Its efficient secretary has served continuously for sixteen years. This Section is threatened with annihilation since the plan for reorganization was adopted. This should be obviated by the adoption of the by-law proposed last year, which would enable the reputable dentists who have a degree of D. D. S. to become associate members of the Association."

Noticing the predicament, and recognizing the high standard of the work of the Section, the Association came to the rescue and passed the following resolution through the House of Delegates.

Dental Members.—Dentists who hold the degree of D. D. S. from a rep-

utable dental college, and who are members of a recognized local or state dental society, may be admitted as dental members on recommendation of the officers of the Section on Stomatology and approval by a majority vote of the Section, the names of such members to be sent to the Secretary by the Secretary of the Section.

By-law.—Dental members shall enjoy the same privileges as regular members and be subject to the same conditions.

It will be seen that not only is the graduate of dentistry placed on an equal standard with the graduate of medicine, but the Association has granted the Section on Stomatology great privileges as well. It has given it its own autonomy. This relieves the officers of the general body as well as those of the Section of some of the annoyance which naturally occurred under the old regime. The D. D. S. pays his \$5.00 membership fee and receives the weekly journal of the Association, which every practitioner of dentistry or medicine should take.

It has been claimed by some dentists that the medical profession has been hostile to dentistry. While it is possible that such may be the case in certain localities and individuals, it is not true of the members of the American Medical Association. When the Section was established at Richmond, Virginia, in 1881, Drs. Samuel D. Gross of Philadelphia, Sayre of New York, N. S. Davis of Chicago, and Toner of Washington were heartily in sympathy with the movement and took an active interest in its welfare from the start. Later Dr. Marcy of Boston not only worked for its interest but read papers before the Section. It is a well known fact that these men are all ex-presidents of the Association. The dental profession has no better champions than the present temporary and permanent officers of the Association. The secretaries from the start have always stood by the Section. Dr. Simmons, the present permanent secretary, has championed our cause throughout the present trouble. He is a warm friend of the Section and always speaks in the highest terms of our work.

I think it safe to say there is not a member in the Association who would not gladly read a paper before our Section upon invitation, and we have had many such papers in the past. There has never been the slightest distinction made between the Sections, and ours has as much influence as any other.

It has been the aim of the Section to elevate the standard of

dental education, and its influence has been felt in universities, in the advancement of their years of study, preliminary education, ground work in medical principles, in the passing of the Army Medical Bill, and the establishment of the Army Dental Corps.

Our numbers have not been large as compared with other national bodies. As compared with other Sections in the national body, with the exception of possibly three, we stand very favorably. There is one great advantage, however, in that when one reads a paper upon any subject before the Section on Stomatology he is sure of an appreciative audience. Every person in the room is capable of discussing the paper to the fullest extent.

OCCLUSION IN PROSTHESIS.

BY C. F. HOWELL, M. D. S., ROCHESTER, N. Y. READ BEFORE THE ROCHESTER DENTAL SOCIETY, 1902.

Considering that so many of us seem to lose track of what nature really intended when we come to set up a difficult upper and lower case or a difficult bridge, it may not be out of place to sum up briefly the correct natural occlusion of the teeth. To begin with, the edges of the anterior teeth above close over those below, and the buccal cusps of the upper grinding teeth close outside the buccal cusps of the lower ones. By this arrangement the buccal cusps of the lower grinders are received into the sulci between the buccal and lingual row of cusps. The upper incisors usually close over the lower for from one-half to one-fourth their length, which allows for their shearing or incisive function. The correct line of occlusion presents a curve from front to back—that is to say, its highest point is at the incisors, curves downward at the bicuspid, and reaches its lowest point at the first molar, curving upward at the second molar and still higher at the third.

However, the plate-maker of experience knows that no matter how desirable this may be in the natural teeth it must be modified very much in detail when it comes to mounting teeth on a plate. The too-positive interlocking of the cusps at any point, and the too-close proximity of the tips of the anterior teeth must be avoided, but the distribution of pressure and the curve from front to back must be followed as nearly after nature as possible if one wishes success in upper and lower cases, and to avoid the clicking that so many plates

have. Where there is unusual width of either jaw or protrusion allowance must be made and the angle of antagonism estimated. Most of these points have become axioms to many of us—not from text-books, however, but from the successes and failures of experience.

It is in the articulation of crowns and bridges with the natural teeth or with other crowns and bridges that there is furnished such a broad field wherein the incompetent and the careless of our profession may sow their mistakes. Success or failure of occlusion in this work is not so sharply defined as with plates. Sometimes it is a matter of months or even years, but when a failure does come it comes to stay, and the victim of the operator who either did not know or had not studied the case realizes that what seemed to be an artistic and well constructed piece of work has been in reality but a regulating appliance which operated without any prescribed limitations. It frequently happens that one or more teeth to which a bridge is attached are moved out of line, and often the whole structure is moved to an angle where the pressure no longer comes on a line with the axis of the teeth to which the bridge is attached. On the other hand, there are many cases of teeth standing alone which are too poorly secured in their sockets to admit of much lateral pressure, but with proper skill they can be attached to more substantial ones by means of short bridges and become useful for years if only the proper line of pressure be carried out and there be sufficient interlocking of cusps to prevent any lateral movement.

In summing up the following questions are raised: First, does the average dentist look far enough ahead in constructing a piece of bridgework? Second, do we often see anything like the proper arrangement of cusps on bridges? Third, in the construction of upper and lower plates how often do we see anything like an attempt to follow the natural curve from front to back that I have mentioned? Fourth, in how many cases are the posterior teeth placed straight up and down or a little outward instead of leaning toward the arch? Fifth, do not many dentists yield to the temptation to insert bridges which, to say the least, are of doubtful utility?

Discussion. *Dr. L. Requa*, Rochester: What the essayist has said in reference to interlocking cusps is all good and true, but he did not say it hard enough. I think the tendency in modern bridgework is to sacrifice utility by making the cusps too prominent. We

see many otherwise beautiful cases where the only motion that can be made is an up-and-down chopping one. Any attempt at lateral swing or true grinding motion throws the occlusion up on to two or three cusps, and the wearer soon gives up the attempt and becomes, so far as chewing his food is concerned, a true carnivorous animal. There seems to be a mistaken idea that in order to have the best possible grinding surface we must have long sharp cusps and correspondingly deep sulci. There is no better chewing arrangement in any animal than that found in a horse or cow, where there is an almost total loss of cusps—simply flat surfaces roughened by unequal wear. These corrugated planes glide by each other with perfect freedom and thoroughly triturate the food. There is one point in the study of occlusion that the essayist overlooked, namely, the tendency of teeth to lengthen after a protracted operation. Often after placing a large gold filling or after a great deal of grinding for a crown, although the occlusion was correct when the patient left the office, he will return the next day with a sore tooth, and investigation will show that occlusion comes on it alone. During malleting or grinding enough continual pressure is made on the parts to squeeze out the contents of the capillaries in the tissues around the tooth, so it is pushed in and remains so until the circulation is re-established, when we find the tooth too long by just as much as it was pushed further into its socket by the pressure.

PREVENTIVE DENTISTRY.

BY C. M. WRIGHT, D. D. S., CINCINNATI. READ BEFORE THE KENTUCKY STATE DENTAL ASSOCIATION, 1902.

The first time I ever heard the term "preventive dentistry" used was a month or two ago by Dr. H. A. Smith at a meeting of the Cincinnati Odontological Society. It expressed so much to my mind that I concluded to adopt it as the title of this paper. The discussion was on "Prophylaxis," which is the word usually employed when we mean the application of hygienic methods or of sanitary measures in dentistry or medicine. I have since seen the words preventive dentistry in the reports of the transactions of the Third International Dental Congress, in the Section on Hygiene and Public Dental Service. In the papers by Prof. Linberg and Dr. Mora, read and extensively discussed in this Section, stress is laid on the

necessity of organized inspection by law of the hygienic environment of school children, and upon the giving of lectures to the schools on subjects relating to preventive medicine and preventive dentistry. Dr. Mora enumerates the following topics for these medical lectures: "Water, Air, Food, Contagious Diseases, Transmission of Disease, Hygiene of Intellectual Work, Salubrity of the School, School Diseases, Disorders of the Scalp, Deformities of the Body, Contagious Inflammations of the Eyes, Parasitic Diseases, Scabies, Scurf, Nervous Affections Contagious by Imitation." "This," he concludes, "is a resume of the principal subjects that should be taught in all educational establishments without exception." These lectures should be delivered by regularly appointed physicians, "and," he says, "as buccal hygiene has now a positive basis—microbiology having given to it the explanation of certain pathological phenomena which hygiene can now prevent—inspections and lectures by dentists on preventive dentistry should also be included and made compulsory."

Many provinces in different countries on the continent of Europe have adopted similar measures for the prevention of disease. I have selected from these reports and discussion just enough to show the interest taken and the trend of thought and activity in these older countries, where dentistry has for a number of years followed rather than led the methods of the American and English practitioners. I could quote at much greater length and bring evidence to prove that the subject of preventive dentistry is a live one in Europe, and that the methods proposed have been along the lines most naturally conceived in countries where the governments are paternal in character.

We in America have had reports from individual dentists who have been permitted through courtesy to examine the mouths and teeth of school children and of children and others in eleemosynary and public institutions. English dentists have also furnished such reports, and they have been of advantage in the study of statistics and have helped in the recognition of the universal prevalence of oral lesions among children.

I consider these reports of individual and voluntary inspectors, as we have had them in America and England, of great value, and while I approve of inspections I do not approve of—indeed, I should vigorously oppose—the establishment by law of lectures either on

medical or dental subjects in dental schools, as recommended by our distinguished European confreres. To comprehend the subjects given in Dr. Mora's list would require a full course in a medical college, and a wide range of thought and study not possible among school children or college students or patients, and a smattering of knowledge on any of these subjects would be worse than useless debris in the brain attics of our children. For the same reason I do not approve of popular tracts, brochures or essays on medical or dental subjects for distribution among school children or patients. We have already too many magazine, newspaper and advertising essays before the people on these subjects. We have also too much "political influence" as a factor in our school management to permit even the selection of proper text-books on physiology for the students of high schools. As an example of this, recall the "alcohol as food" discussion and the politics that entered into the selection of a text-book, where prejudice instead of truth influenced the school boards.

The sort of knowledge offered to school children that is based on prejudice and not on general principles of hygiene is not only not scientific but is distinctly harmful. A much simpler and wiser method of inculcating medical, dental and moral truths would be to have for copy-books texts like these: "Cleanliness Is Next to Godliness," "Moderation in Eating and Drinking Is a Fundamental Law of Health," "Clean Teeth Are an Evidence of Refinement," "Do Not Neglect the Care of the Body," etc., etc. This may seem puerile, but if you had taught physiology for twenty years, and recognized the difficulty of planting broad principles or exact knowledge in the minds of students who purpose to practice some field of medicine as a lifework, you would appreciate the force of the tendency to take up easy theories, or the whims of the day, or the popular text-book, or picturesque doctrines like that of Metchnikoff or Sternberger—where we have the war of the microorganisms and the phagocyte—as the ne plus ultra of physiological and pathological knowledge even on moot questions. Or if you have paid attention to the talk of your apparently most intelligent patients—those who pride themselves on a practical intimacy with hygiene in regard to bathing, ventilation, clothing and diet—and noticed how they have pinned their faith to and built their theories upon methods or doctrines propagated by some society of cranks, or to Lydia Pinkham

or Postum Cereal style of pseudo-scientific advertisements, to Grape Nut lectures, or even to popular magazine writers on sanitary subjects, you will agree with me that a little knowledge if not a dangerous is a foolish thing in medicine.

It would be far better for educated people to avoid entirely the partial and imperfect knowledge which short courses of lectures or tracts or popular literature on medical and dental topics afford. The better the education the more thoroughly is the fact appreciated that every man cannot be his own lawyer or doctor without proving the proverb and having a fool for his client or patient. I therefore believe that in America the cultured people will depend upon the intelligence of the dental profession for the care of their teeth and mouths. They are doing so in greater numbers each year, and for this reason they have a right to demand of the dentist the broadest culture and the most exact knowledge of his own important branch of medical science, and his best efforts in every department of his art.

Dentists are as a class unselfish men, having the true professional spirit and devoting their lives to the improvement of their art, to the better establishment of their science, and for the greatest good of their patients. Methods of preventive dentistry have occupied the earnest attention of the profession from its earliest organization. Older methods of permanent separation of the teeth, and of "oral gardening" or the removal of certain teeth for the benefit of the entire masticatory apparatus; modern methods of extension of cavity borders with infinite pains and labor for the prevention of disease, the selections of materials and modes of operating for the same expressed purpose, and various other proposed and practised plans, have been adopted with the single idea of prevention. Some of these were to guard against the occurrence, like Arthur's permanent separations; others, like Black's and Johnson's extensions, are for the prevention of the recurrence of disease. Dr. D. D. Smith of Philadelphia is doing yeoman work in the field of preventive dentistry—preventing occurrence and recurrence—and if the profession as a whole would follow in his footsteps an incalculable amount of good would be accomplished in preventive medicine as well as in preventive dentistry.

I need not present pictures to you of the wide-spreading influence of oral sepsis on the organism. Wm. Hunter of London has published a little book of thirty pages on "Oral Sepsis As a Cause of

Septic Gastritis, Toxic Neuritis, and Other Septic Conditions," which should be in the hands of every practising dentist and physician in this country. In this nutshell volume, besides giving valuable illustrative cases, descriptive of local and general infections and toxic effects due to septic absorption from the mouth, Hunter points out the fact that while the evil results are extremely common, they are no less commonly overlooked by both physician and dentist. "I consider," he says, "that in regard to oral sepsis there is a wide field open for preventive medicine by the practice of oral antisepsis, by which term I do not mean any general application of mild astringent or antiseptic washes"—he means the intelligent applications and direct treatments that can be given only by the responsible medical or dental practitioner, and he asks, "Who is to do all this? The physician sees the mouth condition and sends the patient to the dentist; the latter will treat the diseased teeth but he will not have the patient come back to be treated locally. The surgeon looks upon sepsis in the mouth as coming within the domain of the physician unless there be actual disease of the jaw, so the patient is left with his septic gingivitis and stomatitis."

Certainly from this view of the question, and in the light of our knowledge of today, the dental profession with all its altruism is overlooking or criminally neglecting this important field for intelligent treatment. When we accumulate enough energy to become interested in this one department of the treatment of septic conditions of the mouth the number of dentists can be vastly increased and still the field will need laborers. This is not new to us, and Dr. Smith has not proposed anything new in his methods. He is rather preaching a well-known but neglected hygienic truth, which is precisely adapted to the peculiar needs of the times.

Every man before me recognizes as basal truths—First. That surgically clean teeth cannot be attacked by caries. Second. That normal gums, mucous membranes and oral secretions will hinder and resist the development of disease-producing agents. Third. That frequent expert operations upon the surfaces of the teeth and gums are required in ninety per cent of the American people at some period of their lives to maintain a physiological condition. Fourth. That it is the special business of the dental profession to supply these expert operations. Fifth. But we must also acknowledge that we as a profession have, notwithstanding our knowledge of and firm

belief in these basal principles, neglected one branch of expert operating, namely, the frequent and thorough cleaning of the entire surfaces of all the teeth of our patients, which is logically first in importance in preventive dentistry.

In the earnest devotion to constructive, reparative, or more brilliant mechanical efforts we have shirked the responsibility of the important work of thoroughly cleaning and polishing the teeth and massaging and caring for the surrounding softer tissues, and have satisfied our conscience with chair talks and lectures to our patients, young and old. We have recommended specially-devised tooth brushes, floss silk, powders and mouth washes. We have occasionally distributed tracts on "How to Care for the Teeth," just as our confreres in Europe are trying to do by law. In short, we have shifted the care of the teeth and mouth as regards cleanliness from our own to our patients' shoulders. From the present outlook, with our bridgework and gold caps, our contour fillings and porcelain inlays, and our devotion to mechanics of a high order, we shall—with the exception of here and there a man—continue to neglect this "minor operation," which we all know holds such a dignified and important place with regard to preventive dentistry and preventive medicine.

It was for these reasons, and because I felt unable or unwilling to change the whole course of my practice, and because I believed that many of my fellow practitioners were in the same condition, that I submitted to my friends of the Cincinnati Odontological Society a plan for the forming of a subspecialty in dentistry which should be devoted to the fundamental preventive operations of polishing the teeth and caring for the mouth, not as Dr. Hunter calls it, "dentally," but daintily. The plan was published in the June, 1902, number of the DENTAL DIGEST, page 446, under the title of "A Subspecialty in Dentistry," and consisted of four propositions: "1. The practitioners of this separate and yet most important branch of dentistry are to be women of education and refinement, who are seeking a field for work of an honorable and useful kind and among people of culture. 2. The dental colleges are to offer opportunities for this partial and separate training, the course to consist of lectures on the anatomy of the teeth and gums, special pathology and physiology, and a special clinical training in prophylactic therapeutics. 3. Upon the completion of this special course, which shall

require one session, or one year of study and practice under instruction in the college infirmary, and after presenting satisfactory evidence of proficiency in the polishing of teeth and caring for the mouth, the college shall grant a certificate of competence to the graduate of this course. 4. With this training and the dental college certificate, these women may be employed by dentists for this special work, or may practice the same in parlors of their own, or at the homes of patients, the dentists giving their influence and recommending the new specialists, just as physicians and surgeons recommend and insist upon the services of the trained nurse or the masseuse." I further said, "I think every one of you will agree that there could be no more valuable service in oral hygiene than that which such a class of specialists would give, . . . especially in conjunction with our surgical treatment of Riggs' disease.

Dr. Truman in an editorial generously criticises the plan and remarks that "this proposition is worthy of serious consideration." He then adds with significant prophecy: "It is certainly true that we are on the eve of a radical change in dental practice. Not that old methods will be given up, but that new ones will be added, not alone for the direct preservation of the teeth from caries, but in the treatment of the oral cavity, to prevent through this source contamination of the entire physical organism. It must be clear that if the intelligent portion of the community had this matter thoroughly explained to them, there would be a rapid appreciation of its importance and an extensive demand for the services of carefully instructed women."

Dr. Truman expresses some fear of these partially educated specialists being tempted to overstep their bounds and wander into the, to them, forbidden grounds of general dental practice. He also sees no parallel between the relation of the trained nurse in medicine to the physician and of these subspecialists to the dentist, but the fact that the partially educated dental profession does not trespass on the private domains of the physician, and also that these women must in the beginning at least be largely dependent upon the recognition and recommendation of the dentist for their employment, seem to me to be a barrier against invasion and a protection against infringement. Then we are supposed to be controlled by state laws regulating practice, and a modification of these laws might be adopted that, while permitting such specialists

to practice, would also control and limit them as we are controlled and limited.

Dr. O. N. Heise of Cincinnati, in an excellent paper entitled "Dentistry As a Specialty of Medicine," which was published in the DENTAL DIGEST for February, 1902, significantly remarks that in cases of accident under anesthetics—heart failure, persistent syncope, etc.—the dentist immediately seeks the services of a physician, showing simply that he feels his limitations. So it seems to me would these women practitioners of this well-defined subspecialty gladly remain within the scope of their privileges.

In a private letter on this subject by Dr. S. A. Hopkins of Boston I learned that others have been impressed with the same hope, and I beg leave to quote a few sentences giving his experiences in this direction: "I would say that the idea of having trained assistants has occurred to me, and some time ago I made an attempt to secure such assistance for my office. I met with opposition from the state board of dental examiners, who frankly told me that they would look upon that as the practice of dentistry and should feel it their duty to prosecute any one who performed even that slight operation without having first passed the board and secured the usual license. I went even further and secured an opinion from one of our best lawyers, which was to the effect that under the present laws of Massachusetts such work could not be done. Consequently our first step in this direction must be a change in some of the laws governing the practice of dentistry. . . . I heartily approve of your suggestion and hope you will keep on advocating the same until we accomplish our purpose."

I felt greatly honored by the invitation to read a paper before this Society, and I have taken the liberty of presenting this subject, which seems to me of the greatest importance to all—not only to the colleges but to the private practitioner and to the people. These specialists which I advocate would naturally be established in the larger cities, but the course could be taken or the subject specially considered by the practitioner in remote rural places, and in giving the attention to it that in the light of our knowledge of preventive medicine it deserves, even the village dentist can largely increase his possibilities for good to his patients and to himself.

Digests.

BICUSPID IN PORCELAIN. By F. J. Capon, D. D. S., Toronto, Can. Read before the Union Convention of the Seventh and Eighth District Dental Societies of New York State, 1902. In complying with your invitation to write a short paper on something practical, I have taken the "bicuspid" as one requiring our attention more frequently than any other tooth, and I think you will agree with me when I say that the bicuspids often tax both our ingenuity and our patience in filling or crowning them. When the large approximal contours—mesially, distally, or both—have been completed, one has a feeling of relief both mental and bodily. To our great surprise and disappointment, however, the bicuspid returns and confronts us with a recurrence of caries at one of the obscure margins; or worse, the beautiful contour has been dislodged for want of tooth tissue for retention, to resist the strain of mastication; or even worse yet, the buccal or lingual surface, the only remaining portion of the tooth, has become severed, the fracture carrying to the wall of the alveolus. These are conditions that confront us continually. Are we always able to meet these contingencies in an artistic manner?

Statistics of the relative liability of teeth to decay give the honor position on the list to the first molars, next come the second molars, then the bicuspids, and so on, with the lower cuspids standing alone as sentinels in defiance of the bacterial army, which from time to time has attacked and demolished the remainder of the line that once stood shoulder to shoulder without fear of such insignificant intruders.

Although molars are the most prone to decay, they are of less trouble to us, as in the great majority of cases, when crowning is indicated, a gold cap will cover the broken-down tooth, and if properly done will give a satisfactory account of itself for the purpose the tooth is designed for as a masticator; but it is the limit line from an artistic standpoint, and even to this must exceptions be added, viz., in the cases of vocalists, actresses, or ladies with expansive mouths who show their teeth from molar to molar. Porcelain is then indicated even in molars.

The exceptions are very few indeed where porcelain cannot be used on first and second bicuspids, upper or lower, in single crowns

or as abutments to bridges. The exception I should make is in the case of a man with a heavy lip and mustache having a short, powerful bite, where heavy mastication is the main consideration. For ladies, where a fixed bridge is indicated, and the bicuspid (the pier for the bridge) is intact, it is preferable, in my mind, to remove the pulp and utilize the canal for the dowel and spur attachment, as a means of preventing the conspicuous gold cap, the open-face cap, or the tearing-down of a good natural tooth—which, like "Humpty Dumpty," can never be replaced.

Every dentist must determine for himself when a tooth is ready or in a condition to require crowning. There is no fixed rule by which to determine the indication; it is of course left to the judgment of each operator. I must say that the judgment of some dentists is sadly wanting; their crowning efforts confront us continually, not only in our offices but in the streets, filling us with mortification over such base methods. It is indeed lamentable that this most valuable method of crowning, with such great possibilities, should have been so abused as to bring discredit upon the profession. It seems to me that there is no more excuse for disfiguring one of our patients, especially a lady, by placing gold caps on any of the ten anterior teeth than there would be for an oculist to replace a lost eyeball with a gold one, which would be neither artistic nor in harmony with nature.

I would suggest that a proper indication for a crown is when the walls of the tooth are so broken down that they give no retentive strength to filling material and no assurance of success to that mode of treatment; *i. e.*, it has gone beyond repair. This might serve as a general definition, but there are exceptions where crowning is quite justifiable, as in cases of disfigurement from a black tooth; irregularity; extensive abrasion or erosion; badly pitted and peg-shaped teeth.

Now there are certain requirements for all crowns—*viz.*, strength, appearance, occlusion, approximal contour with contact, and withal a general fit. It is of course left to the decision of the operator as to what class of crown will fully meet these requirements. In the great majority of cases porcelain is able to fill the bill, but being a vitrified mass, and therefore more or less friable according to bulk, there are cases of bicuspids which are presented for crowning that will severely tax the best judgment in order to get a satisfactory result. A

combination crown of porcelain and metal is more desirable esthetically than the all-gold cap; the latter may be used only where the more artistic crown has failure written upon it, in which case I presume a gold one would necessarily be chosen rather than the loss of the root.

In speaking to one not thoroughly acquainted with the uses and strength of porcelain, he is very apt to remark that "porcelain crowns are all right to look at, but one wants something to masticate upon." In an article in the *Review* for September, 1898, Dr. Nyman of Chi-

FIG. 1.



FIG. 2.



FIG. 3.



cago describes some experiments made by him as to the strength of porcelain which are positive as well as interesting and astonishing. To quote:

In order to ascertain about what strain the average bicuspid and molar porcelain crown would withstand, the writer constructed what he thought was an average-size crown of each of these, identical in every way with a crown that would be constructed for practical purposes. They were ground off flat on both top and bottom. The dimensions were as follows:

	<i>Bicuspid.</i>	<i>Molar.</i>
Top to bottom.....	7 mm.	7 mm.
Mesio-distally	4 "	8 "
Bucco-lingually	6 "	6 "

Justi's teeth as facings and Close's body were used. These were then tested at the Armour Institute of Technology in a standard testing machine (made by Riehle Bros., of Philadelphia) by E. C. Kerr, the professor of mechanical engineering, with the following results:

	<i>Bicuspid.</i>	<i>Molar.</i>
Cracked	1,740 lbs.	2,230 lbs.
Crushed	2,240 lbs.	4,020 lbs.

These results seem astonishing, and as the average crushing force of the human jaw is about 175 lbs., the writer believes that this demonstrates beyond a doubt that the average porcelain crowns have strength sufficient to withstand any pressure that may be brought to bear upon them in mastication.

The condition of the root as the foundation for the proposed crown is the first consideration, and, as I have already said, often requires

rare judgment to determine upon a plan. Various conditions may be enumerated as follows: (1) A typical bicuspid root in healthy condition with coronal portion broken down, pulp extirpated, bite normal and of sufficient length for porcelain. (2) Same conditions as (1), but bite close and the use of porcelain doubtful. (3) Fractured root, caused by the parting of either the buccal or lingual walls of tooth, severing deeply under the gum margin, beyond reach of a banded crown. (4) Root badly decayed below the gum margin with frail cementum walls. (5) Root in better condition than the last mentioned, but not enough projecting root margin for banded crown, yet strong enough to support a crown.

Condition No. 1—The first consideration is the mechanical preparation, which for any crown is a most important step and possibly determines between success and failure in the operation; its importance, however, has been so strictly dealt with by teachers that one can pass on. We will suppose, then, that the enamel edges have been cleaved and the root trimmed to at least the gum margin buccally, or

FIG. 4.



FIG. 5.



FIG. 6.



perhaps slightly below. If occlusion space is a consideration the palatal portion may also be trimmed to the gum edge, following the festoon of the gum for the remaining surface of the root, having sufficient root for banding so that it will not impinge upon the pericemental membrane. It is a frequent practice to cut the root down considerably lower at the septum, especially if the bite is short, so that a greater body of porcelain may be got on the crown for strength. (Fig. 1.) By so doing it will cause irritation to the periodontal membrane, with a lameness and a falling of the septum in the interdental space; it will have lost its natural surroundings, which cannot be brought back by any artificial means. If the bite will permit it, a projection of the palatal portion above the gum margin is an advantage for strength and retention. (Fig. 2.)

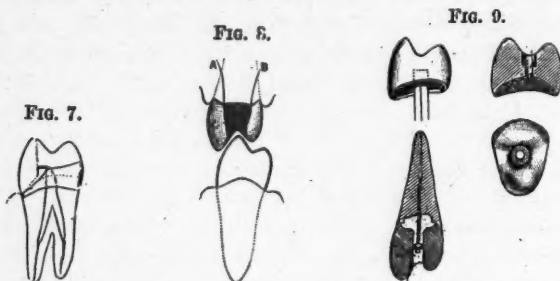
Condition No. 1 gives us an indication for almost any porcelain crown with a fair chance of success, but as a bicuspid has a large part to play in mastication, having an occlusion surface with a vertical stress, and cusps which give it a lateral stress in two direc-

tions, it is well then to have a band to accompany the crown, as the chances of fracture or dislodgment by the lateral pressures are materially lessened.

For some years the writer has confined himself to an original crown (*Cosmos*, February, 1902), believing it to be strong, which is an all-important consideration, for no matter how beautiful a crown may be, if it is not strong enough to perform its duty it is worse than useless, as it will be sure to come back to you with the double responsibility of removing the fractured portion, which at times is by no means an easy matter.

The Crown in Detail. Having taken the size of the end of the root, a band of platinum (which for porcelain should have a lap or covered joint) is made with plenty of width to accurately fit the root, festooning for the septum; the band should be wide enough so that when it has taken up its proper depth in the free margin the remaining width will stand well above the face of the root. While the band is in position on the root, with a sharp-pointed instrument scratch on the inside of the band the line of the root, also on the outside of the band mark the buccal festoon of the gum line (Fig. 3). Now with a pair of fine-pointed scissors cut out the buccal half of the band to the marked gum line (Fig. 4), and if the root will allow it, file a little below it; place the band on a piece of platinum sheet, No. 30, mark the shape of the band upon it for the palatal two-thirds (Fig. 5), trim with scissors and file accurately to the mark, and fit it to the line on the inside of the band. It is now tacked to position with pure gold or platinum solder, after which that part of the apron remaining may be pressed down to the buccal portion of the band and the solder complete its course around the band (Fig. 6). Trim off any surplus and file the buccal edge rounding, which allows of a better and stronger extension of porcelain on the band. The pulp-canal is now made ready to receive a square iridio-platinum dowel; a small hole is made in the floor of the cap opposite the canal and the dowel forced home through the hole with the cap in position on the root. The band and dowel are carefully removed together and soldered in their proper relation. The extended portion of the band can now be given the approximal contour with contact to the adjoining teeth, which with porcelain is just as essential for the protection of the septum of gum in the interproximal space as for any other work. The shade, bite, and

impression in plaster are taken, if the crown is to be completed in the laboratory. It is well in the meantime to cover the root with temporary stopping to keep the gum from creeping over the edge of the root. The selected facing is ground in position; it is then invested and the pins of the facing soldered to the dowel or to the floor of the cap (Fig. 7). All excess of pins or dowel head should be removed and the remaining parts nicely rounded; the bulk of body is preferable to the platinum ends, which invite fracture to that portion of the crown which is weakest. The framework of the crown is now ready to receive the body, proceeding along the lines of any porcelain crown. The portion of the band projecting above the face of the root forms a "cup" in which the porcelain has its base and gives to it the additional strength required for mastication, so that the liability of fracture of the porcelain is reduced to a minimum. The facings of these crowns give little or no cause for



anxiety, as they are made with "block" body, the entire surface of which is etched to the body of the crown. It is soldered as well. These "cup crowns" in porcelain can be used to serve as abutments of gold bridges, as solder can find ample surface of attachment on the mesial, distal and palatal surfaces.

Condition No. II—Root in same condition as No. I, but bite close; use of porcelain doubtful. I have already said that bicuspid and molars require a crown that will withstand the force of mastication. The former in my experience are the most difficult to contend with, and more especially when the bite is short with the lower cusp occluding in a deep sulcus. (Fig. 8.) As a rule this condition gives but slight indication for an all-porcelain crown, especially if the retention is wholly dependent on a dowel, which greatly weakens the already weak portion of the crown. The natural bicus-

pid is prone to fracture more than any other tooth by reason of a deep sulcus and often a close occluding and interlocking cusp of the lower tooth; add to this that the main portion of the tooth has been taken away and probably replaced by a filling that sooner or later makes fracture of the buccal or lingual wall almost a certainty (Fig. 8, A and B), which might prove serious, if it were severed below the alveolus.

All the manufactured (ready-made) crowns for bicuspid either have a dowel-head or a hole, which is placed in the center, the weakest part of the crowns, rendering them almost out of the question for this particular condition. (Fig. 9.) This cup crown which I have suggested can be made with or without a dowel. It comes to our aid in just these cases.

Condition No. III—Fractured root caused by the parting of either the buccal or lingual walls of the tooth, severing under the

FIG. 10.



FIG. 11.



FIG. 12.



FIG. 13.



gum margin beyond reach of banded crown. To save time I will combine conditions Nos. III and IV into one, as the procedure in root-restoration for a foundation is similar. *Condition No. IV—Root badly decayed below gum margin, with frail cementum walls.* In those roots where there has been such extensive loss of tooth-substance that hypertrophied gum overhangs and possibly fills the root, one may grasp at the remains to build on a crown for esthetic effect alone. In these cases the root form is to be restored sufficiently to furnish a good base. It is generally necessary to cut out the fungus growth, and perhaps better results are achieved by the electro-dental cautery, being able to proceed at once, otherwise the gum must be pressed back with temporary stopping, to free the root edge from the overlying gum. The next step is to bring the root from the pathological condition to that of health.

It is very necessary to restore the root form by means of a rigid and insoluble material; good amalgam is best adapted for this pur-

pose, and should be used with the same care that is required to make a good filling. If the edges are accessible, the root is dried, the canals cleared and tapped for the reception of a gold screw-post; after placing a small portion of cement on its extremity it is screwed into the canal. The root is given an undercut if possible, to aid in retaining the amalgam, which is packed about the post over the face of the root to the gum margin or even higher, as the case demands. (Fig. 10.) If the root is fractured or decayed considerably below, then a matrix with an apron to take in the extent of the fracture is required, into which the amalgam can be packed.

In restoring a bicuspid root on which a collar-crown is to be placed the matrix is made deep enough to grasp the end of the root as firmly as possible, and to extend about one-eighth of an inch above the margin of the gum. (Fig. 11.) After a few hours the matrix can be removed and Rhein files passed down under the gum to remove any rough edges of amalgam. In any case the external edge of amalgam can be ground to suit the kind of crown desired. There is no crown, to my knowledge, better suited to such a foundation than the one mentioned for the other conditions, but of course no dowel could be used; perhaps a modification of one could be applied, if one thought the retention insufficient by band only. By trephining the amalgam from around the screw-post, a tube is fitted over the post and pushed through the floor of the cap and soldered, the free end of the tube is pinched together, and the pins of the facing soldered to it. (Fig. 12.)

Condition No. V—Root in better condition than the last mentioned, but not enough projecting edges for a banded crown, but still strong enough to support a crown. This condition, with its concaved root-face, gives as a rule ample room for a mass of body which will be sufficiently strong for the occlusion that one would give to a root of this caliber. In all possibility it would be a crown for appearances; in such a case I would hardly define the palatal cusp, to lessen the liability of breakage or dislodgment. The more accurately this class of crown fits the face of the root the greater chance of success. Then I would proceed by burnishing a piece of platinum, No. 35, to fit the face of the root. One can often obtain an approximate shaping by using a small piece of compound on the end of a pine stick, heat over a flame and take the impression of the end of the root, and by pressure first, and then by gentle tapping

with a hammer on the end of the stick, the compound will have forced the platinum nicely into position. Now remove, and having fitted the post, marking upon it the length it went into the canal, push it through the disk and solder. The disk and post are placed back onto the root and burnished closely, and with fine-nosed pliers a slight band can be turned on it that will help to retain and protect cements. The remainder proceeds as for any porcelain crown. (Fig. 13.)—*Cosmos*.

METHOD OF RECORDING GRAPHICALLY THE MOVEMENTS OF THE MANDIBULAR CONDYLES IN THE LIVING SUBJECT. By George G. Campion, L.D.S., Eng. Some months ago, in some experiments with Bonwill's and Christensen's articulators, Dr. C. H. Preston and I found that the ability of the instrument to reproduce even some of the simpler movements of mastication depended largely on the position on the articulator in which the models were fixed. We also found that a simple way of securing the correct position was to make an impress of the lower front teeth in composition in a small tray to which two copper wires had been soldered, these wires issuing from the mouth and being long enough to be bent up over the cheeks and have their ends so adjusted as to be exactly over the position of the condyles, as ascertained by palpation. I have since had an instrument made (shown in position in Fig. 1) in which two brass tubes can easily be adjusted to positions exactly opposite the two condyles and fixed there firmly by thumbscrews. Though made for the purpose of adjusting models correctly in an articulator, it occurred to me afterwards that the same instrument might be used for recording the positions assumed by the condyle in different movements of the mandible. For this purpose a piece of pointed brass wire is made to slide easily but accurately in the tubes, and the point being charged with some coloring matter which does not quickly dry (such as rouge mixed with oil to a creamy consistency), the varying positions of the condyle can be readily indicated by a succession of dots on the skin. A piece of white blotting paper is then gently pressed over them, and from this the record can be easily transferred to paper or a ground-glass lantern slide.

I reproduce here the first eight records made in this way, and which seem to indicate that a good deal is to be learned by this

method of investigation. They are all of the left condyle and show the movements in seven different individuals. In Fig. 8 are placed side by side two tracings from my own left condyle. These were made on two separate occasions by two separate individuals neither of whom had used or even seen the instrument before, and their close resemblance seems to show that the allowance to be made for error is not very great. It will be noticed that in one of these two tracings the position of occlusion is omitted: this is because in clos-



Fig. 1. Showing the pointed wire in position for marking.

ing the mouth for this position to be marked I did so unknowingly in a forward position, and though this was shown very well on the tracing I preferred to omit it altogether rather than correct it by guesswork. In any case the position of occlusion in all these tracings is probably to some extent wrong, owing to the interposition of the tray between the upper and lower teeth. In some cases it may be possible to eliminate this error entirely by specially adapted trays, and so obtain a check on other cases where this cannot easily be done. Another defect in these tracings is that their relation to some definite

THE MOVEMENTS OF THE MANDIBULAR CONDYLES

FIG. II.

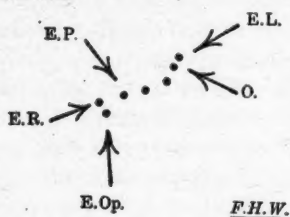
F.H.W.

FIG. III.

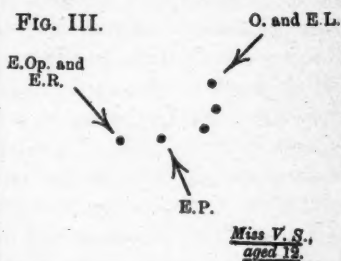
Miss V. S.,
aged 19.

FIG. IV.

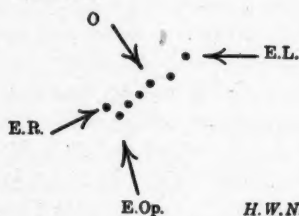
H.W.N.

FIG. V.

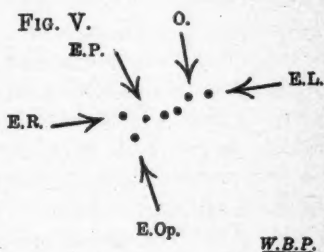
W.B.P.

FIG. VI.

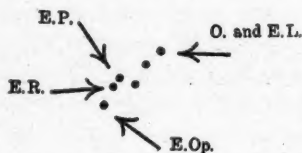
C.H.P.

FIG. VII.

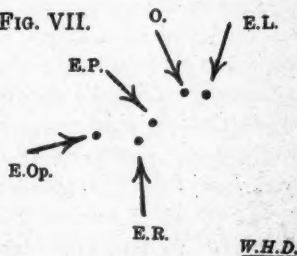
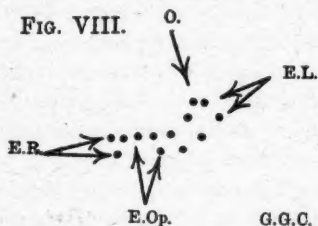
W.H.D.

FIG. VIII.

G.G.C.

O. = Occlusion.
 E. Op. = Extreme Opening.
 E. P. = Extreme Protrusion.
 E. R. = Extreme Right.
 E. L. = Extreme Left.

line on the face is not shown. Probably a line from the lower margin of the nose to the external auditory meatus would be a convenient one for this purpose, and there would of course be no difficulty in fixing exactly their positions in relation to this; but after making full allowance for these and probably other imperfections inseparable from first attempts, the results are sufficiently striking to be worthy of some notice. The positions recorded explain themselves when it is stated that in those of extreme protrusion and extreme right and left the teeth were as nearly closed as the apparatus would permit.

If these first tracings should prove to be at all typical it will be seen at once how widely the movements vary in different individuals. To take two salient points: In Figs. 3 and 6 the positions of occlusion and extreme left movement coincide, while in Figs. 4, 5 and 7 the left condyle recedes markedly in the extreme left movement, and in Fig. 4 the dots indicating these positions are no less than 7 mm. apart. In Fig. 3 the points of extreme opening and extreme right coincide, in Fig. 8 the point of extreme right is well in advance of that of extreme opening, while in Fig. 7 the point of extreme opening is still further in advance of that of extreme right. In Fig. 7 the relation of these two points was so exactly the opposite of what I had recorded in other cases that at first I suspected some error, but a repetition of the movements showed the same positions, and they were confirmed by a friend who was looking on at the time. It should, I think, be possible by means of this instrument to determine in different individuals the relative amount of movement in the condyles in the initial, intermediate and final stages of the act of opening, and I hope to record some observations on this point before long.—*Jour. Brit. Dent. Assn.*

FUSING-POINT OF PORCELAIN. By W. A. Capon, D.D.S., Philadelphia. A few years ago this subject would have passed with small interest, because it mattered little to the general dentist what heat was required to fuse porcelain, so that it came from the soldering investment in proper form and shade. Colleges teach the fusing-point of various metals, because it is of practical value to every dentist at some part of his career, and now that a porcelain furnace is almost necessary to an up-to-date equipment it is quite as requisite to know the materials used in that connection. The dentist can buy a variety of porcelain bodies, just as he can buy porcelain

teeth, with the difference that his knowledge of the former is limited as compared with the latter, which have shape and shade and are ready for the use he has been taught to give them, and rely upon them according to his confidence in the manufacturer.

He knows that a certain degree of mystery surrounds the making of teeth and the mixing of the various ingredients, while the formulas of the different manufacturers are a trade secret known only to a select few. From a trade standpoint this is correct and not to be criticised, but from the professional view it is only right that every dentist should know as much as possible about the manufacture of teeth, and I have no doubt that as the use of porcelain becomes more general the interest in everything pertaining to it will become greater, until manufacturer and consumer will understand that each can render the other mutual assistance.

The following tests were prompted primarily by a desire to supply the dentist using the electric furnace with accurate data as to the relative fusing-points of porcelain materials likely to be used in the various dental processes for inlay, crown, bridge, and continuous gum work. With this end in view a pyrometer manufactured by Kaiser & Schmidt of Berlin was purchased. This selection was made on account of its absolute work, its excellent mechanical construction, and the fact that its accuracy is guaranteed by a certificate from the German government. The Western Electric Instrument Company of this country also gives a certificate confirming the accuracy of the galvanometer, which is the registering part of the apparatus. The principle of the instrument is that of a thermopile, which by the action of heat upon certain dissimilar metals creates a current of electricity capable of being measured. As many metals of dissimilarity have an electric thermal action, it follows that to register the higher heats metals of the highest degree of resistance must be used, so in the Kaiser & Schmidt pyrometer platinum, which fuses at 3227, and rhodium, with a fusing-point of 3500, are used in the form of parallel wires, united at one end in a ball, the whole being known as a "couple." The free ends are electrically connected with the galvanometer. The method of operating the instrument is to enter the ball end of the "couple" into the furnace, just above but not quite touching the material to be tested. The heat acts on the couple at once, and the slight current of electricity generated and carried through the connective wires is registered on the galvano-

meter. The greater the heat the higher the reading. The readings on the galvanometer are taken from two scales, one registering the current generated in millivolts representing so many degrees of heat centigrade. To reduce the centigrade degree of heat to Fahrenheit it is necessary to multiply by 9, divide by 5, and add 32.

By repeated experiment I learned that the fusion in all cases was accomplished at a relatively low heat by giving a long exposure. I therefore, for the purposes of practical work and to secure a uniform standard of comparison, decided to raise the temperature on each material to such a degree as to admit the use of a uniform time limit of two minutes, and adopt as a standard a temperature which, continued during the stipulated time, should fuse the material under test.

The method of preparing the test pieces was to mix the powder with water to a stiff creamy consistency; the mass was then spread to a thickness of about five thirty-seconds of an inch, and the excess of moisture absorbed with blotting paper. The edges were then trimmed so that the test pieces were of uniform size of three-eighths of an inch square by five thirty-seconds of an inch thick. Each test piece in succession was then allowed to remain on the furnace platform until dried out, after which it was placed in the furnace under full temperature.

In opening the furnace door to introduce the test the heat naturally dropped a number of degrees, therefore the time record was not taken until the door was closed and the temperature again raised to the full heat the furnace was gauged to develop for the special test in hand.

All the tests were made in a Hammond electric dental furnace under absolute conditions. All the materials were in powdered form purchased in the open market, or in the case of a tooth, the bodies were secured from the factories of the respective makers.

Pyrometer tests, November 24, 1902, to determine the fusing-point of porcelain inlay materials, also tooth bodies herein enumerated, are as follows:

Temperature.

Downie's	1544
Jenkins'	1544
Ash's low fusing	1544
Ash's high fusing	1904

Moffitt's porcelain	2047
Brewster's enamel	2084
Consolidated high fusing	2192
Brewster's foundation body	2210
Whiteley's porcelain	2210
Close's foundation body	2300
White's porcelain (inlay)	2300
Parker's body	2586
Ash & Sons' tooth body	2264
Sibley's tooth body	2408
Dental Protective Supply Company's tooth body.....	2440
Justi's tooth body	2440
S. S. White's tooth body	2516
Johnson & Lund's tooth body.....	2586
Lukens' tooth body	2606
Century tooth body.....	2624
Consolidated Dental Company's tooth body.....	2624

For three reasons these temperatures can be accepted as being absolutely correct, for every detail was given the most minute attention. First, the voltage was controlled to 110 without deviation. Second, these figures represent several trials of the same material, and third, the watch was assisted by the eye, which is the only sure way of knowing when porcelain is properly fused.

The placing of plaster Paris in the furnace should be avoided, as it fluxes the clay and exposes the wires, very much as water would wash dry material, leaving a little glaze over the wires, which deteriorate and form a weak spot. This may be due to a chemical combination with the silicate in the fire-clay which attacks the platinum wire. Powdered silex under very high heat will also combine with the clay and expose the wire, readily allowing a short circuit by metal contact.

No doubt many will be surprised at the low figure of many porcelains generally thought to have a much higher fusing-point. As an instance I will use Close's continuous gum body, which is known probably better than any other. It has been quoted at 2600, and even as high as 2800, and the lower fusing materials at 1900. However, I think with many others, that a porcelain fusing at 2200 or 2300 may have all the qualities necessary for the general purposes required in present-day operations.—*Brief.*

THE SONG OF THE COMMONPLACE. By C. L. H., in
Western.

I sing the song of the Commonplace;
The song of Little Things in Dentistry;
The drop of Oil that smooths the machinery;
The adjusted Brushes and a Commutator that does not spark;
I sing of Broaches that have been tested before being tried and
Of Pure Gold Backings that burnish to a close joint.

I sing of Dry Canals and Paper Points,
And the song of Getting Ready before you commence.
Who handles the Millions has garnered well the Pennies.
So shall I sing of Clean Solder and Fluxed Joints,
Of Thin Investments and Brush Flames,
Of fewer Instruments and more skill in using them,
Of one Instrument that does many things.

I sing the song of Great Undertakings, which is the song of the
First Step;
The song of Opened Cavities before Treatment,
Of Mechanics before Therapeutics.
Where is the man that shall show me something?
That man has been on his knees searching!

Do I sing of great Bridges? No,
I sing of Coned Roots, well filled,
Parallel and straight up.
Of Cocain in powder, not in solution,
Well powdered and triturated, and
Carried under the gums with fine instruments, and
Into the pulps of teeth on broaches;
Of Absorbent Paper *versus* Greasy Cotton,
Of Absorbent Paper, well rolled up beforehand, and a rack for
Broaches;
Of a Cold Bottle in hot weather—for mixing cement only, and
An Air-Blast when hot air won't do.
What a little thing is a draft of air,
But what wonders will it not work!
I sing to the man who knows how much Alloy to put

Into his Solder without weighing it, and who
Utilizes gravity in the flow;
Who turns his patient's head to the side and
Throws the saliva-sucker out of the window.

I sing the song of one who can see in the dark,
Of the man who sees with his mind as well as his eyes.
I sing of the man who tries new things;
Who drives a wedge into the jungle.
I sing the song of Gutta-percha Pulps instead of dying ones,
Of dry Amalgam well hammered in against a stiff Matrix;
I sing the song of the Matrix, one not made of tissue;
Of Matrices in all plastics.

I sing to the dentist who educates his patients,
To the teacher who is glad to learn, yet gives of himself;
Who works for love as well as lucre.
I sing in praise of the man who has no lost motion;
Who does not backlash and take up slack.
I sing the song of Little Things, for they are the song of the Solar
System.
The song without end.
From the Atom to Atman is but a question of perspective.
He that hath an ear let him hear
What the Spirit saith unto the Churches;
He that doeth the little thing shall be called a Worker of Wonders.

MODEL ALTERATIONS. By E. M. Kettig, M.D., D.D.S.,
Louisville, Ky. It is not my intention to bring out any new points
in this most important step in the construction of artificial dentures,
but merely to again call attention to certain facts, that if neglected
in even the most perfect models may seriously affect the proper fit
of the plate; while if properly understood and carried out they will
not only make perfect models and produce better-fitting plates, but
in many cases imperfect models can be so altered as to produce plates
that will give good service. As I said before, attention has been
drawn to model alterations before, but good things cannot be re-
peated too often, especially when so few dentists pay much atten-
tion to detail in plate construction, and then become discouraged

at the poor success of their efforts in mechanical dentistry. I have rarely seen a model, no matter how perfect a reproduction of the mouth, that did not need some change so as to give the plate constructed over it better stability in the mouth. Lower models, when made from good impressions, should not be altered much, as the ridge is narrow and the pressure great, and any change in contact of plate with gums will manifest itself in bearing unduly hard at one place or another. It is in upper models, both partial and full, that alterations are permissible and necessary, especially in full cases in the majority of mouths.

Method of Procedure. The man who alters a model for a full upper case must be thoroughly familiar with conditions in the mouth; it cannot be entrusted to a laboratory assistant. First, an impression should be taken with the greatest of care, and in the majority of cases with plaster, then a separating media used that will be exceedingly thin, so as not to obliterate any of the fine lines of the impression. Every ruga, fissure, convolution of mucous membrane or uneven surface must be accurately produced and preserved, so that the model will be what is ordinarily understood as perfect. Next, it is the best plan to have the patient in the chair, and having the model in one hand, we examine the mouth with the other and make comparisons. If the mouth is uniformly hard, few alterations are necessary, except at the posterior limit line of plate on either side of the median line at the palato-alveolar juncture. Here the scraping should be on the model to the depth of one-twelfth of an inch, beveling out in all directions less until lost from the focal point. In models of this kind no other change should be made, and as a rule no air-chamber added. If the mouth is not uniformly hard, but inclined to hard and soft places, much judgment is necessary, for if we do not make provision for the contact of the plate in these unequal parts it will surely not give the best results. With patient in chair and model in hand, we must after examination of the mouth mark with lead pencil on the model the areas that need scraping. I believe a properly constructed air-chamber will add much to the stability of the plate, but one that is so made as to allow the gums or mucous membrane to cup into it and entirely fill the space is *not* properly constructed, and when we see a patient with the imprint of an air-chamber well defined in the roof of the mouth and the tissue cupped down, we know the air-chamber was faultily

built in that case, and of no use. It should be shaped the same general form of the model, placed in the highest part of the arch, with an equidistant space between it and the top of ridge and posterior limit line of plate. Its edge should be beveled slightly and not be too sharp. After securing in position, a groove should be cut in plaster all around the edge of the air-chamber, except its anterior surface. There should be no groove here on account of the liability of infringement upon the naso-palatine nerve, which passes from its foramen at about this point and may cause paralysis or distant neuralgia, such as headache, if the plate rides unduly upon it. This groove about the air-chamber should be about one-twelfth of an inch deep and about the same distance from the edge of the cavity. This groove forms a ridge on the finished plate which not only answers the purpose of checking the ingress of air that may slip in from the margins of the plate, but holds the mucous surfaces from cupping into the cavity, due to the atmospheric pressure from without continually exerted upon this focal point. Having arranged the air-chamber, the soft places are to be scraped, and if properly done the hard places will take care of themselves. The softest places are on either side of the median line at the palato-alveolar juncture of the palate bone. Digital examination of the mouth here will reveal a decidedly soft spot on either side. These should be scraped to the depth of a line beveling in all directions until lost, except posteriorly, where it should be increased.

Grooving the Model. Then if the mouth is one that has much hard and soft surface, a groove should be trimmed a line in depth all around the model half way between the top of the ridge and rim of plate laterally, and continued over the heels and between posterior edge of air-chamber and limit line of plate. This gives an air-chamber within an air-chamber, and if properly made adds much to success in difficult cases.

Use of Modeling Compound. In mouths where the ridge is very soft and mucous membrane abundant, I don't think much of plaster in taking impressions, but prefer modeling compound. My method is to secure the best possible impression with compound, then trim out a uniform layer of its surface inside the impression after it has set, spread a thin layer of warm compound uniformly over it, and take a second impression. This not only gives uniform pressure on all parts of the mouth, but the compressibility of the soft gum

tissue should be taken advantage of with the pressure necessary in the second addition of the compound, as much force is necessary to properly mold the material over the parts. This cannot be done with plaster, and while it is in all other cases the material par excellence, in these extremely soft mouths it is contraindicated, and better results can be obtained with compound.—*Summary.*

LABIAL FRENA. Separation of the central incisors by the frenum of the upper lip does not seem to be so generally recognized as one would expect. The frenum, instead of blending with the muco-periosteum on the anterior aspect of the alveolar process, is continued between the incisors and blends with the tissues in the region of the anterior palatine foramen. Mr. Henry Moon was, we believe, the first to draw attention to this abnormal development of the frenum that has been described in most of the recent text-books. Mr. Percy A. Longhurst sends us what is probably the correct explanation of this abnormality. He says: "As regards the etiology of this anomaly the following seems a plausible explanation: A portion of epiblast from which the epithelial structures are derived is included during the union of the mesio-nasal processes of the fronto-nasal processes, which forms the os incisivum (endo-quattrion). Owing to deficient union or delayed union this portion of epiblast sometimes fails to be sufficiently absorbed and persists as a redundant frenum. The inferior labial frenum is formed by an involution of epiblast between the mandibular plates (first branchial arches), and is continued between the mandibular plates as far as the root of the tongue, where it meets the tuberculum impar, from which the anterior part of this organ is developed, and forms the lingual frenum. When approximation of the mandibular plates occurs the labial frenum is differentiated from the lingual—its continuation. Redundancy of the latter is associated with tongue-swallowing, deficiency with tongue-tie. This inclusion of epiblast takes place at a very early period of intrauterine life, as all the various fissures of the face are closed by the tenth week."

To treat the condition with any certainty of success, the frenum must be severed in such a way as to prevent the upper lip exerting the pulley-like action of the frenum on the teeth, and it is necessary to excise or destroy its attachment to the muco-periosteum. The removal of a V-shaped piece, so often recommended, is at times worse

than useless, as union between the fresh surfaces may occur and the tension on the teeth in that way be increased. If treatment is carried out before the eruption of the cuspids, those teeth in erupting will usually exert sufficient lateral pressure to approximate the incisors, so that mechanical devices are seldom required.—*Jour. Brit. D. Assn.*

TUMOR OF THE PULP WITHOUT CARIES OF THE TOOTH. By Dr. Pont (*L'Odontologie*). I have observed a case which has appeared so interesting, and at the same time of sufficient rarity, as to deserve publication. The patient, M. X., engineer, was a man thirty-five years of age, of good health, and exhibited nothing particular in his hereditary and personal antecedents. He consulted me about six months ago in reference to a pain he felt at the level of the second upper premolar on the right side. I carefully examined the tooth, but could not discover the least trace of caries. Of course I refused to extract it, notwithstanding the pleading of the patient, and contented myself with the application of the cautery. I ordered a local treatment, and recommended him to come and see me in a few months' time, if he suffered again. At the end of three weeks he came back, telling me that the treatment had relieved him for a few days, but that the pains had soon returned with greater intensity than before, and he again requested me to remove the tooth. I examined it anew, and this time it presented the following characteristics: It was still absolutely free of caries, even under examination with the magnifying glass; but under illumination I observed that it exhibited through its transparency a vinous red color, clearly standing out from the normal color of the contiguous teeth. I decided to trepan the tooth; but as soon as the drill had gone beyond the limits of the enamel it encountered no further resistance, and the patient announced a slight pain. With an enamel chisel I chipped off without much effort the entire triturating surface. I was then able to see that the whole crown was occupied by the pulp and no longer possessed any dentin, the enamel forming a kind of shell filled completely and exclusively by the soft tissue of the pulp. This latter exhibited the following condition—its coloration was dark red; it was soft, and could be easily dilacerated, and was not too painful. Its immediate extirpation was moderately easy, and did not produce much hemorrhage. What was the diagnosis to be admitted in such a case? Chronic hypertrophic pulpitis must not be thought of, for the patient

had never previously suffered from this tooth, and the examination by means of the magnifying glass did not permit the observation of the least trace of caries. One might have thought, according to the rules, of an aneurism of the pulpar artery. This diagnosis, in fact, explained the reddish coloration and the disappearance of the dentin; it is known that aneurisms cause the restoration even of the osseous tissue when they are in contact with the latter. But this affection could not be admitted, for the opening and the extirpation of the pulpar mass did not provoke any hemorrhage. It therefore had to be admitted that we had before us a primitive tumor of the pulp. The microscopical examination alone could answer the question as to what was the nature of this tumor, and I purpose to make this known to you in a later communication. After having performed the immediate extirpation of the pulp, I put in the dressings customary in similar cases, and at the following appointment I filled the canal with a gutta-percha cone and placed cement on top of it. I did not wish to put in a pivot tooth, as I could not say whether or not the tumor would recur, and in such an event I did not desire to see the pivot incriminated. I therefore put the patient under observation, and am awaiting results. I have never observed a similar case, and the bibliographical researches which I have been able to make have had a negative result.

PRINCIPLES FOR CAVITY PREPARATION. By J. M. Meyer, D. D. S., Tacoma, Wash. Read before the Washington State Dental Society, May 23, 1902. I have not prepared a paper upon this subject, but intend to talk from the standpoint of principle, and not ideal cavity preparation. Ordinarily the text-book divides this subject into three classes: (1) Opening the cavity; (2) Removal of decay; (3) Shaping the cavity. The idea from the standpoint of principle is that throughout the subject in the text-book we find principles for cavity preparation cropping in here and there—disconnected, as it were—and from a standpoint of study particularly for the dental student, the scheme is without classification.

I have divided this subject under the head of five general classes: Class I: Exposure. Class II: Removal of foreign matter and necrotic dentin. Class III: Shaping of the cavity related with the dentin—known as the cavity proper. Class IV: Shaping of the

cavity related with the enamel—known as cavity margins. Class V: Supplemental considerations. Under each class I will arrange the principles involved in that particular stage of the operation.

Class I.—Principle A. All cavities are to have such exposure as will admit of access to all parts for preparation and the introduction of the filling material. Principle B. Where fissures exist they are to be included in the exposure of principle A, throughout their extent. Principle C. Any imperfection of the enamel associated with the orifice of the cavity is to be included in the exposure; in other words, the exposure is to be extended to strong and perfect enamel boundaries. Principle D. Where margins of the cavity approach developmental grooves such grooves are to be included in the exposure. Principle E. Where margins of the cavity approach the gingival boundary the exposure is to extend beyond such line. Principle F. Cleavage lines of the enamel are to be considered in making the exposure.

Class II.—Principle A. Foreign matter is to be removed with tepid water thrown from a syringe. Principle B. Apply rubber dam or employ other means to exclude moisture; dry cavity with absorbents and warm air. Principle C. Remove necrotic dentin by cutting in a direction from the pulp toward the enamel; all devitalized or softened dentin should be removed. The exception to this principle will be that portion of dentin immediately overlying the pulp organ.

Class III.—Principle A. That portion of the cavity related with the dentin should be as nearly a retaining shape throughout as the case will admit. Principle B. The cavity proper is to have a flat base, with the walls at right or acute angles wherever admissible. Principle C. Undercuts are to be so placed as not to weaken the walls; pits or grooves are to be made in the dentin, not between dentin and enamel. Principle D. Where fillings are exposed to the pressure of mastication special attention is to be given to stress. Flat surfaces at right angles to the direction of such force, and of equal area to the exposure, should be employed.

Class IV.—Principle A. Enamel margins are to be supported by underlying dentin. Principle B. Margins are to be strong (not feather-edge) and beveled to an obtuse angle with surrounding surfaces. Principle C. All angles of the orifice are to be well rounded. Principle D. Margins are not to relate with approximating teeth.

Class V.—Principle A. Proximity of the pulp is to be considered at all stages of the operation. Principle B. Sensitive dentin is to be treated as indicated. Principle C. Thermal extremes to exposed cavities are to be avoided. Principle D. All cavities are to be sterilized before filling material is introduced.

To suggest that principles will not prepare cavities for filling teeth will call forth no opposition. An old operator, once asked what in his opinion was the best filling material, said: "In all my experience as a teacher and practitioner the best material I have yet found is 'common sense.'" Principles alone will not produce the requirements; no more will "common sense," but principles first, well mixed with practical experience, with a liberal seasoning of common sense, will produce results in dentistry as the principles of surgery have served suffering humanity in the hands of the general surgeon.—*Cosmos*.

GERMS THAT WORK FOR MAN.—Microbes kill about 15,000,000 human beings a year. Everyone who dies of smallpox, plague, consumption, or any other of the long list of febrile diseases known to humanity, is killed by microbes of various degrees of malignance. So it seems at first sight that the greatest boon which could be conferred upon the human race would be the abolition of microbes from the face of the planet. If this could be actually accomplished and all microbes wiped out in a moment all infectious diseases would certainly disappear; but so also would many other things. Like fire, microbes are bad masters, but on the other hand are such good servants that without them life would be impossible.

Ever since the first farmer turned cream into butter man has been making microbes work for him. A microbe shaped like a little rod ferments cream, and without it no amount of shaking or churning could turn the cream into butter.

A similar microbe converts curd into cheese. The butter and cheese microbes must have air, and cheese like Roquefort and Gruyere differ in flavor from having been exposed to the air for a longer or shorter time.

The yearly liquor allowance of a British inhabitant is about 33¼ gallons. But for microbes there would be no such thing as wine, beer or spirits. Beer yeast is nothing but a microbe which grows so quickly that one becomes 35,000 in 48 hours. It works so hard turning sugar into spirits that unless it is given full play it will burst a

cask or bottle like so much gunpowder. These microbes when under a microscope look like strings of roughly-made beads.

The microbe that turns grape-juice into wine resides on the skin of the grape; the one that makes the malt and hop liquor seethe and work is generally started to business by putting into the mixture some of the scum from the old fermented beer.

Bakers would not be able to do business if millions of slaves in the way of microbes were not ready to work for them. A morsel of yeast is put into a mixture of flour and water, and masses of little workers immediately turn to and convert the starch of the flour into sugar, and when this is done, the sugar into alcohol and carbonic acid gas. The gas rises and turns the dough into a light sponge, leaving the baker nothing to do but mold his loaves and put them into the oven.

Another useful little microbe is always toiling away, turning cider or wine into vinegar for our pickles and salads. "Mother of vinegar," as this little creature is known, looks when magnified like a series of tiny chains with rather long links. It does its work quite unaided. All it asks is to be kept from too great cold.

Gunpowder seems an odd thing to owe to microbes, but gunpowder could not be made without saltpeter, and saltpeter is the result of the long-continued industry of millions of microbes. This special microbe feeds on decomposing animal matter, and where there is any potash nearby produces saltpeter. Saltpeter or niter in some form is absolutely necessary for the growth of plants, so here again the microbes are doing good work for the farmer. A certain kind of microbe is so fond of nitrogen that it steals it from the air. A field of wheat, the soil of which has been inoculated with this microbe, grows magnificently and produces splendid crops. The farmer of the future will carry his fertilization to the farm in a small glass bottle, instead of hauling it by the ton with heavy horses and carts.

Now that every existing disease, from leprosy to a boil, has been found to result from the misdirected energy of some microbe, science has harnessed these evil growths, dwarfed them and is using them to fight their parents.—*Alk. Clinic.*

DIET IN RIGGS' DISEASE (PYORRHEA ALVEOLARIS).

By J. Warren Achorn, M. D., Boston. Read before the Northeastern Dental Association, Oct. 16, 1902. If water were the only food required, other things being equal, everyone's health should be equal to every other one's. But things never are equal, and so there is a decided difference between water and its effects and what this or that one eats or drinks; something makes this one fat and that one lean, this one plethoric and that one anemic, this one rheumatic and that one lithemic or asthmatic. Inheritances, habits, work, surroundings, temperament, play, food, and drink, all have to be considered in the sum of the things that finally get a well man out of order. If the stool of health requires three legs before one can sit on it safely, and one of these legs is found to be lame at some time, will you not agree with me that in a chance lot of cases it is more often found to be due to something eaten than to anything else?

Most of us go on eating and drinking and doing things we learned to do unconsciously as children or acquired in some other thoughtless way without regard to the after-effects, never once seriously asking ourselves whether as individuals this is the right thing for us, until some fine morning disease drives us to consult a *doctor*, and we find we are in for it, with no better reason or excuse than this, that we have taken too much for granted.

The Personal Equation in Eating.—Many people eat seven things right and in the right way, but Heaven only knows what they will do when it comes to that eighth thing, that something they like in particular, that has six inches of "taste good" in it for them and twenty-three feet of stomach-ache afterward for solution. It may be this eighth thing alone that plays havoc with their digestion and metabolism. Controlling the indiscriminate use of some one food or class of foods will work wonders occasionally. One person may eat a thing objectionable for the average individual and never hear from it, because for him there is nothing indigestible about it; his neighbor, looking on, thinks he can do the same, not appreciating the individual factor in the equation, and so it goes until they are all at it. It is all summed up in the expression, "Oh, that won't hurt you."

There was probably a time when a man could eat anything in sight, simply because he lived, like any other animal or vegetable, in the open air and did not have much to choose from; his diet was sustaining, but a simple one. Now he is fenced in by stone buildings, he

walks on stone streets, and looks out upon the world through a hole in the wall. Is it any wonder, in view of all the changes to which he has been subjected, in view of the innumerable things he is doing in a hurry, and the foods he is eating in a hurry, brought from all parts of the world and cooked in all sorts of ways, that his digestion fails, that he gets out of tune or out of proportion and finds himself troubled with some chronic ailment, the result of misfit food, waste in his system, or something worse? What one can eat with impunity at twenty is not necessarily the food that fits best at forty; with each decade the food that one eats would better be modified to satisfy special indications or changes incident to age and occupation. Would it not be a wise precaution for everyone to consult his physician once a year at least, and let him say what if anything is wrong with the machine, the way it is run, or the food it is given. We all go to our tailor, our hatter, our cobbler, and may I not say to our dentist (for I have an idea that people go more readily to the dentist than to the doctor) with fair regularity, and why not to the chief engineer of the body for inspection and a certificate good for six months or a year? Preventive medicine is the only true way to practice the art, but the world, as you know, the Western world, does not think so. Here we work at our professions, dentists and physicians alike, with the cart before the horse.

The Physiological Balance.—If a man's lung capacity is what it should be compared with his weight, and his lung capacity is not below the standard for his height, if his blood and urine are right under the microscope, and all his eliminative organs are acting normally, if his food and drink are sufficient to maintain his health and strength against his work and habits, if he is physically sound and at peace with himself, he is as near perfect as he can ever hope to be in this world. My definition for all this is "physiological balance," something all persons should strive to keep if they have it, or to attain by right life and living if they haven't it.

A man five feet eight inches in height, and twenty-two years old, should have a lung capacity of two hundred and thirty to two hundred and forty cubic inches, and weigh one hundred and fifty-five pounds. For a woman five feet three inches in height, nineteen years old, the lung capacity should be one hundred and fifty cubic inches, and weight one hundred and thirty pounds. I simply give these

measurements that you may realize even while I am speaking how far the average individual is from the ideal standard.

Chronic disorders, such as rheumatism, lithemia (American gout), real gout, dyspeptic asthma, certain kinds of headache, gastric hyperacidity, biliousness, and acne, are recognized by physicians generally as due in part and in some instances entirely to disorders of digestion—the result of misfit foods or failure of elimination from whatever cause.

Nutrition and Riggs' Disease.—It was while engaged in rectifying ills of this sort by dietetic treatment and other associated means when indicated that I incidentally treated pyorrhea alveolaris and succeeded in relieving some cases and curing others. I did this unconsciously in the beginning, Riggs' disease being a local disorder to my mind at that time.

Sometimes the case was one of obesity complicated by rheumatism; sometimes one of hyperacidity associated with headaches or constipation; sometimes lithemia or biliousness was the fundamental symptom, and sometimes there was no diathesis. The patient was out of tune mentally and had lost his balance physically from overwork or worry, or was handicapped by a small pair of lungs, or by a weak heart and small digestive organs, that in turn affected his elimination or nutrition; in a word, the machinery was not adequate to the mill in which it was set up; and here is where this idea of *balance* finds its greatest application.

If the case under consideration was one of the uric acid variety, as the majority of them were, I restricted the use of acids for a time, whether that found in meat, fish, vegetables, or condiments. When this diathesis was not present either in the family history or in the patient, I dieted according to the indications, always with a view to securing relief by gaining the coveted physiological balance, a normal physical and mental condition such as I have already defined.

Predisposing and Substitute Foods.—I am satisfied that meat and sugar in excess aggravate the group of disorders under discussion, including Riggs' disease. How much this disease is conditioned upon the local action of these and other foods I am unable to say. Curiously enough, the uric acid in meats and the uric acid in nuts, even though they be identical, do not act in the same way when taken into the system. I have seen aches and pains follow the use of meat, and this was not the case when nuts were ingested.

The uric acid foods are the red meats,—steak, roast beef, etc., and all viscera, such as liver, sweetbreads, and kidneys. Among the liquids may be mentioned tea, coffee, cocoa, beers, and soup made from meat stock. Mutton, lamb and veal are among the least objectionable of the red meats. The red meats that seem to be an exception to the rest are venison and rabbit. Wild animals, being much more active and having purer food and water to eat and drink than the stall-fed animals of commerce, are freer, I imagine, from waste products—from their own rheumatism, if you please. At any rate, these meats do not act as injuriously as those that are stall-fed.

The substitutes for red meat are the white meat of chicken, turkey, capon, fresh fish (that is, they contain less uric acid), eggs, oatmeal, gluten, macaroni, peas, beans, nuts, milk, and cheese. I mention peas, beans, and nuts here, because they do not produce in my experience the same effect upon the system that the commercial red meats do. With some, red meat may be eaten once a day aside from fish. White meat and fish I rate about the same, except that white meat is the better digested. If there are "symptoms," vague aches that persist, I generally stop meats altogether, unless sufficient water is being taken to keep the system free.

The substitute drinks for tea, cocoa, coffee, etc., are the cereal coffees, water, milk, buttermilk, and white wines in moderation.

The uric acid vegetables are peas, beans, and here I will mention nuts. Then there are those that contain oxalate of lime, which is akin to uric acid in its action on the system, asparagus, spinach, cabbage, rhubarb, tomatoes, carrots, string beans, celery and radishes. Vegetables containing these acids should have a restricted use, as may be determined by the condition of the patient and in part by examinations of the urine.

The best sugars are pure maple syrup in season, pure honey for those who can eat it, sugar of milk, and saccharin. When maple syrup cannot be obtained, syrup made from the maple loaf is preferable to the granulated sugar. This choice is due to the difference in local effect, the maple syrup in my experience being less irritating to the stomach. Maltose and other western products of the kind are useful, but a taste for them has to be acquired. With the sorghum of the sugar cane I have had no professional experience. Sugar in measured quantities is a desirable food for children, with their activities and rapid digestion to be satisfied, coupled with the demand

for a food that will afford quick energy and make ready fat; but for grown people its use in excess is unhealthful, a source of intestinal fermentation and of irritation throughout the system. Its free use and that of red meat in the class of disorders enumerated is certainly bad.

Fruits have a limited use much the same as have vegetables. The innocent-looking cultivated strawberry is by no means innocent. It is usually in a state of mild decay when eaten, but this is smothered under sugar and cream. Even wholesome strawberries of the cultivated sort work mischief; there is something in them that causes aches and pains pointing to systemic disturbance. Sweet grapes and uncooked pears eaten freely induce lassitude, nausea, and consequent loss of appetite. All fruits would be better cooked and eaten without sugar, or only a dash of it. The safest fruits are apples, raw or cooked, baked pears, white grapes, oranges, cantaloups, plums, and peaches. Bananas baked in their jackets are rendered quite digestible. I may add here that the free use of vinegar, pickles, and condiments is unwise.

For the rest, most fine-fibered fish are allowable, if fresh, such as cod, haddock, flounder, the lean of shad and bluefish, raw oysters, and plain lobster; perch, bass, or other lake or brook fish, baked or broiled, but never fried. Fried food is an abomination. The frying-pan landed here in 1492 and from that day until recent times it has ruled over every stomach and kitchen in the land. The people in New England are still in love with it, and in the southern states, where the standard of cooking is measured by the darky mind, it rules supreme. I am honestly of the opinion that fried food has caused as much misery, first and last, as alcohol.

Eggs are often eaten in too great quantity. On account of the fat and iron contained in the yolks they produce the condition known as biliousness. They are better eaten on alternate days of the week, soft-boiled or poached.

The use of breads and cereals depends upon whether the patient can digest them readily, is in need of carbohydrates, or should be denied them. That starches aggravate the diseases under consideration, by inducing intestinal fermentation when not properly cooked, or when eaten in too great a quantity, is true. The starch of loaf bread, potatoes, beans, and sweet potatoes is seldom thoroughly cooked and is therefore open to suspicion. White bread as ordinarily

toasted is made worse by the operation; if toasted and redried, the starch is converted. Rye, graham, and stale white bread are the best of the home-made kinds. Rusk, zwieback, the crust of French bread, Pilot bread, and Cestus phosphated crackers, can all be used to advantage at times. Beans baked in the ground are all right. Cereals as now prepared for the market are a wholesome class of foods. Butter is the best fat, and next to that olive oil or cream. Bacon fat is also useful eaten with dry toast. The amount of fat and the kind depend upon the needs of the patient and his ability to digest it. Fats are not acted on in the stomach. Desserts are a snare; an inducement for those who have eaten enough to eat more only to do them harm. If a patient has a poor appetite that needs tempting they are permissible, but an equally good way to nourish is by a fourth meal at bedtime,—strained oatmeal gruel, hot milk with Vigor chocolate, an egg in milk or swallowed whole in Moxie.

The Use of Water.—The unintelligent use or the lack of use of water is often a cause of chronic ailments, due to disorders of digestion. The best time to drink liquids is an hour before breakfast, between meals, and on retiring. Not more than one or two glasses should be taken at mealtimes, and no other liquid should be drunk if soup be indulged in. I may say of soups that in small amount they are not objectionable. In the diseases under consideration soups made from meat stock are contraindicated; they are simply so much urea. Milk and meat do not go well together, or milk as a beverage with vegetables. Milk goes with eggs, fish, fruit, or cereals. It were better sipped during the meal. Tea and meat do not go together; the tannin in the tea hardens the meat fiber. Cereal coffees, water, or wine go with meats. Some people wash their food down with whatever they may be drinking. No liquid should be drunk until after the food in the mouth is swallowed.

The constitutional treatment of Riggs' disease from a dietetic point of view is not essentially different from that of other disorders due to food not suited to the individual, to diatheses, inheritances, and bad habits. I insist in addition only upon the physiological balance when lost, or there is an approach to losing it, for I am satisfied that there may be cases of pyorrhea alveolaris, as there are other unhealthy physical states without a name, that are due to want of balance and that alone. You all know better than I the percentage of cases that are of purely local origin, and the immediate causes for

it; probably the larger proportion of all cases would be in this class. I only hope, if you have intractable cases, whether or not under the bane of some diathesis, you will resort, to help you out, to dietetic and hygienic treatment such as the indications suggest. Riggs' disease as I see it is a wholesale problem in certain cases, and the cure depends upon nothing being overlooked that tends to aggravate the trouble and upon everything being done that will raise or lower the individual until he is at par with himself and his surroundings.—*Cosmos*.

SUSCEPTIBILITY AND IMMUNITY IN DENTAL CARIES. By C. N. Johnson, L. D. S., D. D. S., Chicago. Read before the Society of Dental Science, St. Louis, November, 1902. In the study of disease one of the things of prime importance is to first learn the cause or causes so as thereby to be better able to control and prevent it. The history of dental caries shows that while the profession generally have not studied as carefully as they should the various factors entering into its cause, yet a small band of investigators have from the early part of the past century been from time to time suggesting theories to account for this disease. The idea of the early pathologists, that disease came primarily from some disorder inherent in the organism, and was merely a surface manifestation of something going wrong within, was shared by those who first began the study of dental caries. They had the idea that the cause was within the tooth structure, and that the breaking down of the enamel was merely the effect of some internal disturbance. In looking about for a plausible theory to fit this assumption they naturally fell upon the idea of inflammation, and the inflammatory theory of dental caries became so rooted in the minds of many prominent men that it took more than half a century to completely eradicate it.

As far back as 1828 Robertson pointed out that the cause, whatever it may have been, was something acting on the surface of the enamel immediately at the point where the decay began, and that the process was from without inward instead of from within outward. Various theories were then advanced with regard to the nature of the particular agent which caused the breaking down of the structure, notable among which was the mineral acid theory, charging sulphuric, hydrochloric and kindred acids with the trouble.

But in 1884 Dr. W. D. Miller made his noteworthy contribution to the subject, in which he proved that the solution of the enamel was due to the presence of vegetable acids formed by the growth of microorganisms in the mouth, and thus gave us the first really intelligent point of view from which to consider the subject. From that time forward men have been studying the disease with Miller's demonstration as a basis, and while some additional light has been thrown on it, there still remain many phenomena connected with dental caries upon which the profession are yet at sea. One of these is the manifestation of susceptibility and immunity—a factor which observant men are rapidly beginning to recognize, but the reason for which is not so readily understood.

It is a well-known fact that while this disease would seem at times to be almost universally prevalent in the human race, there are many individuals who never have decay of the teeth, and there are very many more who, though exhibiting the disease at certain periods of life, finally become immune to its attack and are not extensively troubled with it afterward. Since microorganisms have been demonstrated to be the cause of the disease, it would naturally be expected that in mouths free from caries there would be found a practical absence of microorganisms, but the important fact is that even in these immune mouths we may find an abundance of germs, and not only that, but the very class of microorganisms which Miller demonstrated would produce caries. It would therefore appear that there must be some important factor in the case aside from the mere presence of microorganisms, and much thought is now being given to this particular phase of the subject.

Dr. J. Leon Williams pointed out in 1897 what he considered a significant fact in this connection. It is manifestly evident that an acid of sufficient strength to dissolve enamel as rapidly as we sometimes see it done in the mouth must be formed in immediate contact with the enamel, and must be held there and so protected from the fluids of the mouth that it is not diluted and rendered ineffective. It is inconceivable that the saliva can ever be sufficiently acid to account for the solution of tooth structure as it occurs in caries. If it were so strongly acid as this the soft tissues of the mouth could not tolerate it, and besides, if the saliva were the agent of caries we should find the teeth breaking down uniformly upon all of their exposed surfaces, instead of finding, as we do, the penetration of

carious cavities at specific points where we have learned to look for them. It is therefore patent that the acid of decay must in some way be protected so that it is enabled to do its work undisturbed by the fluids of the mouth, and Dr. Williams has suggested a possible explanation of how this may be done.

There are certain kinds of microorganisms that are called gelatin-forming on account of the fact that in their growth they produce a material similar in appearance to gelatin. We find these prominent in the mouth, and if a careful examination be made of the teeth after all loose debris or food material has been rinsed away with water, it will frequently be found that gelatinous films may be scraped away from the surfaces of the teeth, particularly from those regions on the enamel where there is no friction to keep the surfaces wiped clean. By friction is meant the passage of food over the teeth in mastication, or the rubbing of the tongue or cheeks against the teeth in speaking. It is Dr. Williams' idea, and one also shared by Dr. Black, that it is under the protecting influence of this gelatinous film that the microorganisms are enabled to form their acid in contact with the enamel without being washed away by the saliva or so diluted as to become ineffective. In fact, Dr. Williams, by a marvelously skillful technique, was able to make a microscopic section of a tooth, retaining the microorganic film *in situ* upon the enamel, and showing the action of decay taking place under it. This, of course, was not positive proof that decay could not take place without the film, but it was at least circumstantial evidence not to be ignored, and it gave an explanation of certain phenomena in dental decay that had previously not been satisfactorily explained. It showed how decay could begin upon a perfectly smooth surface of enamel where there was no defect in the tooth structure, and where under ordinary circumstances the saliva would interfere with the concentrated action of the acid.

It is true that there are certain forms of decay which do not seem to fit perfectly into this theory, and Dr. Miller has recently published an article in which he claims that the case is not yet sufficiently proved that the film is a necessary factor in the disease. This question requires further study before an unqualified statement may be made on either side, but to those who carefully note the manifestations of caries in the mouth it would seem at least plausible that the film was an important factor in the *modus operandi* of the

disease. While there may be mouths in which gelatinous films are present without decay of the teeth, it has yet to be demonstrated that all of these films are of the same character, or are produced by the same family of microorganisms. It is possible that we are dealing with complications in variety here as elsewhere in organic and microorganic life.

There is one thing patent to every observer who has studied clinically the manifestations of immunity and susceptibility in the mouth, that at the time of change from active susceptibility to a comparative immunity there is a general clearing up of the fluids of the mouth and an apparent solution of the glutinous or gelatinous material therein. The conditions surrounding the teeth are so altered and the change so apparent that it is very striking to the close observer, and it is to be hoped that in the future some investigator may point the way whereby the secretions may be so changed by treatment that a condition of immunity shall be established in a patient who has previously been susceptible.

This leads to another consideration bearing on the subject which requires repeated emphasis. As has been indicated, the old idea of disease embodied the theory of inherent weakness in the structure as accountable for the breaking out of the malady. In line with this it was taught that the reason why some teeth decayed and others did not was due to the fact that some teeth were soft in structure and thus susceptible to disease, while others were hard and able to resist it. The fallacy of this was proved by the investigations of Dr. Black in his study of the physical character of the human teeth. He demonstrated conclusively that so far as density is concerned there is really very little difference in the structure of the teeth of individuals, and that what little there is seems not to have the slightest relation to the inception of caries. And yet, with the record of these investigations published six or seven years ago, we frequently see references in our literature to the same old story of hard and soft teeth. This would be strange were it not for the fact that there is really something in the case very misleading to the profession. Most of our writers have formed their impressions as to the structure of the teeth solely by clinical observation rather than by laboratory investigation, and when the teeth are studied in the mouth during the progress of operations upon them they exhibit such a variation in behavior under the use of

instruments that it seems small wonder the profession should be misled. Some teeth cut away very readily, while others stoutly resist the sharpest instruments, and it is difficult to make the average operator believe that there is not a vast difference in the intrinsic composition of the two extremes of teeth. But when these same teeth are examined as to their constituents it is found that they are astonishingly similar, and that the difference in behavior under instruments must be accounted for in some other way.

The fact is that it is due mostly to a difference in the arrangement of the enamel rods. In some teeth the rods run straight and are comparatively even in arrangement, while in others they pursue a wavy course and apparently interlace and twist about in such a way as to make instrumentation upon them exceedingly difficult. If a tooth of this sort were encountered by the average operator he would at once vote it a hard tooth, and if he saw a mouth in which all of the teeth exhibited a tendency toward this kind of structure he would assume that such a mouth was not likely to take on the carious process. But a close clinical study will show that these teeth frequently do decay, and also that in other mouths, where the structure is such that instrumentation is easy, the teeth are comparatively free from decay. The simple fact is that it is a question of environment instead of tooth structure which influences for or against dental caries. If the conditions surrounding the teeth are unfavorable for the active agent of decay to work, the softest kind of tooth will remain free from caries, while in a mouth susceptible to the disease the hardest possible tooth will be broken down. Just what constitutes the condition tending to immunity or susceptibility the profession are not yet clear. Immediately following Dr. Williams' demonstrations it was believed by some that in view of the supposed significance of the gelatinous film the main point determining condition related to the tendency or otherwise to the formation of films in the mouth, and it was thought that immune mouths, although exhibiting the presence of micro-organisms, did not furnish favorable opportunities for the production of gelatinous material, while susceptible mouths were those in which the films readily formed. But it may in truth be said that this question of the real significance of the film has not yet been sufficiently settled to justify definite conclusions upon it, and as has been intimated, further study is needed to give it a final status.

In the meantime Dr. Michaels of Paris has been investigating the subject from another point of view. He has become impressed with the idea that the saliva has great diagnostic value as an index to various abnormal conditions in the human body, and as an apparent evidence of the correctness of his view he has by a mere examination of the saliva, without any further knowledge of the patient, been able to correctly diagnose such diseases as cancer, etc. It is his belief that eventually, when the character of the saliva is better understood, we may be able to demonstrate certain conditions in the saliva which tend to favor decay of the teeth, and if we can do this and thereby learn the particular element or elements in the fluids of the mouth which control this matter, we shall soon be placed in a more intelligent relationship to the phenomena of immunity and susceptibility, and be able to accomplish more for our patients. Just so soon as we learn definitely what it is that constitutes the chief factor in this disease, just so soon may we begin a rational search for the means of controlling it, and when that is accomplished we shall have taken the first long step towards preventing dental caries.

But the only basis of combating this disease at present at our command in the way of establishing immunity is along a line suggested to us by clinical observation, and some of the developments are exceedingly interesting. It may also be stated that they are very encouraging when we consider the possible results to our patients by a close observation of the phenomena presented to us in clinical experience. We find that not only do individuals differ one from the other in relation to their susceptibility to caries, but also that the same individual will exhibit varying degrees of susceptibility at different periods of life. A close study of this particular phase of the subject will prove of immense value in practice, and will eventually result in the saving of many sets of teeth which otherwise would be consigned to the forceps. It shows us that the most discouraging case of caries need not be considered hopeless so long as there is sufficient tooth tissue left upon which to build a filling, and it also proves that no matter how prevalent the disease of caries is in a given mouth, or how many teeth are involved, there is always the possibility of changing the mouth from a condition of susceptibility to one of immunity, and eventually saving the natural

teeth in a state of serviceable usefulness through life—so far at least as decay is concerned.

It will usually be found that one of the active periods of decay occurs before the twentieth year. If decay can be held in rigid subjection till this age the most serious battle is won. This statement has reference, of course, only to the natural order of things and does not account for those exceptional cases in which decay seems continuously active despite the best efforts of the patient and operator. Nor does it imply that there will be no further need of dental service in mouths where immunity seems to have been once established. Recurrence of susceptibility is likely in this disease, as in others, and we may find cases in which there seems to have been established a condition of immunity, but in which at some subsequent period a new crop of cavities springs up and we have another contest before us to control the disease. But a significant thing in this connection lies in the fact that the disease is usually more readily controlled in subsequent attacks than in the original one, and the period of susceptibility seems greatly lessened. The reason for these outbreaks of decay is not due, as has often been stated, to the fact that the teeth change in structure and grow soft at such intervals, but because the conditions surrounding the teeth change in character. As has already been intimated, teeth do not grow hard and soft in this way, and we have to look to something outside the teeth to account for the phenomena. At times we think we can point to some particular change in the individual which might modify the secretions to the extent of rendering an immune mouth susceptible, such as an illness, a change of climate, the period of gestation, or other disturbances calculated to interfere with the regular rhythm of the economy, but at other times an active attack of caries may manifest itself without any apparent change in the individual that we can find to account for it.

The practical lesson to be learned from a close study of the manifestations of immunity and susceptibility relates to the fact that we are never justified in abandoning the worst case of dental caries that presents for treatment. No matter how unfavorable the symptoms may seem, we can never tell when a change in the conditions will bring about a practical cessation of the carious process, or at least will greatly lessen the tendency to decay in that mouth, and to that extent aid us in getting control of the difficulty. It is our duty

to institute an active campaign against the disease and fight it back at every point by filling operations or by crowning the teeth where filling is impracticable. The thing of prime importance is to keep decay out of that mouth as far as possible. These susceptible cases should be seen at frequent intervals and cavities filled the moment they appear. This, in connection with prophylactic measures, such as cleanliness, and the establishment of full functional activity in the way of thorough mastication, will bring about a condition of immunity very much earlier than would result if the case were left to itself.

This, then, should be the constant aim of the operator—to take the susceptible cases which come to him, particularly those of patients early in life, and manage them with the one end in view of establishing as early as possible a condition of immunity. If the profession will work studiously along this line it will place them in a more intelligent relationship to their real function as practitioners, and enable them to do more substantial service than they can hope to accomplish by the mere routine work of performing mechanical operations on the teeth without a realization of their true significance. To do less than this is to fall far short of what should constitute the ideal of dental practice.—*Review.*

EMPYEMA OF THE ANTRUM OF HIGHMORE. By Dr. Frederick C. Cobb. Read before the Boston and Tufts Dental Alumni Association, October, 1902. Empyema of the antrum is a somewhat hackneyed theme and I fear I shall tell you many things you already know as well or better than I. It is only on looking backward over the last ten years or so that we realize the improvement in methods of diagnosis and treatment that have resulted from the work done on this subject. It will be interesting and instructive to see what those changes have been.

It is not difficult to understand why disease of the antrum was overlooked up to twenty years ago. The characteristic symptom of empyema is a nasal discharge, sometimes foul but always purulent, and in most cases unilateral. This was set down to the credit of the catarrh, and everyone was satisfied and the discharge went on. Sometimes, however, owing to polypi in the nose or within the antrum itself, the small passage leading from the sinus into the nose became obstructed, and acute pain followed by redness and

swelling below the eye or lip became apparent. The abscess, unable to discharge through the nose, had made its way through the bony wall and discharged through the face. The surgeon drained the antrum through the cheek, curetting out the interior of the cavity and packing, or as Miculiz recommended, destroying the nasal wall below the lower turbinate and throwing the abscess into free connection with the nose. Then it was that the antrum acquired the reputation which it has never since lost, the reputation of a cavity which is most difficult to heal. For in spite of drainage, in spite of every antiseptic known (and it seems to me that almost all of them have been tried on the antrum), the cavity resolutely refused to heal.

If we read the account of the earlier surgeons, how bone after bone of the wall was removed until little but a sinus remained and yet healing did not result, we do not wonder that the antrum obtained this reputation, which nevertheless is quite undeserved. We were told by all the earlier writers that the anatomical situation of the antrum, with its opening into the nose situated at its highest point, like the little window at the top of the old-fashioned dungeon cell, was unfavorable to drainage, and that to be properly drained it must empty at the bottom. At first sight this seemed reasonable, yet an antrum under favorable circumstances healed within a few days. This was found by experience, but how could we reconcile fact and theory? It seemed reasonable enough after we began to realize that a human being, unlike a dungeon, is not always in the same position; that, in fact, for one-third of his life he is in a recumbent position, with the outlet of his antrum in the best position to drain it. Such a simple explanation seems unnecessary, but you have only to look over any text-book to find that many such statements as that quoted pass without contradiction.

I have said that the older physicians were not unfamiliar with acute forms of antral empyema, but the subacute forms were unknown to them. The advent of the laryngologist and the nasal speculum produced quite a new state of things. In the attempt to cure a nasal discharge the first question suggesting itself was the origin of same. It was found that frontal, anterior ethmoidal and posterior ethmoidal cells and the sphenoid all pour their secretions into the nose, and that all these cavities are subject to empyema. Differentiation by the location of the pus in relation to the middle turbinate could be made between the frontal and anterior ethmoidal,

which emptied below the middle turbinate and the others mentioned, the posterior ethmoidal and sphenoid which discharged above. The diagnosis of these cavities still, however, presents great difficulties and we are only beginning to study them as they deserve.

Diagnosis by Antral Illumination.—The antrum, however, owing to its greater accessibility, has received more attention. Voltolini first drew attention to the illumination of the antrum by electric light placed in the mouth and this has been of great service. By the aid of this, with the fact of a unilateral discharge, we are enabled to diagnose pus in the antrum. His opponents argued that the bones of the face differ as much in thickness as the antra themselves vary in size and that therefore the light would vary with these conditions. My experience is that if one gets a nasal discharge on one side without any visible reason in the nose, and darkness on the same side combined with clearness on the other, he can feel very safe in diagnosing antral empyema. The darkness in antral suppuration is not due to the presence of pus in the antrum but to the thickening of the mucous membrane which results from the presence of the pus. This can be easily proved by washing out the antrum and then transilluminating again, when the cavity will be found to be as dark as before.

Relation of the Ethmoid to the Antrum.—But empyema of the antrum means the presence of pus only, it does not mean necessarily that the inflammation arises in the antrum. And this fact brings us to a further and most interesting discussion. A few years ago we all supposed that pus in the antrum meant an inflammation of the cavity itself, but a curious case which occurred here in Boston threw a different light on the subject. A patient of a prominent laryngologist here was sent for antral empyema to a well-known dentist. The dentist removed a second molar and washed out a large quantity of pus. The antrum filled up again and again, and finally after a year of washing the patient went to New York, where Dr. Bosworth found an ethmoiditis, and after curetting and burring in the ethmoid region in two or three sittings succeeded in curing him. No treatment was directed to the antrum.

This case suggested at once, of course, that the antrum was in some manner dependent on the ethmoid and might have served as a reservoir to it. To establish this point I removed the anterior wall

of the frontal sinus in the cadavers at the Harvard Medical School and injected ink, tilting the head from one side to the other, and found that on opening the antrum of the same side, the cavity was stained with ink. Dr. Fillebrown had proved the same point by his excellent investigations with the probe, passing it from the frontal sinus to the antrum, and to him belongs the credit of the discovery, although his article had not been published at the time of my experiments. By the proof of the connection of the antrum with the ethmoid and frontal sinus, it became at once evident why so many cases of antral disease had not been cured. We were draining and cleaning the reservoir while the polluted brook which led to it was still pouring its filth into the wound. Of course any antrum which is full of pus will give the same signs on transillumination and the same discharge of pus as one in which the purulent process started *de novo*. These experiments showed why it was that antra had failed to heal under all the radical measures directed against them by surgery. To prove that the antrum does not deserve its reputation as a difficult cavity to heal was left to other clinical data. A few cases will illustrate that it will heal with great rapidity.

Cases of Rapid Healing of Antra.—J. L. entered the Boston Dispensary complaining of a foul discharge from the left nostril. Transillumination showed the antrum on the same side dark; pus was seen under the middle turbinate, and examination of the anterior wall of the antrum showed a small sinus leading upward. This sinus was cut down upon and a tooth removed, which Dr. Edward Briggs assured me was a second molar. The patient was twenty years old and had had the discharge two years, he said. After the removal of this tooth an opening remained so large that a slate pencil could be passed into the antrum. The antrum was washed once or twice, and within a week all subjective signs of an empyema of two years' duration were gone and did not recur.

The same result was true of a doctor's wife operated on by Dr. Maurice Richardson. Many times I have seen the removal of a tooth result in complete cure in a few days. Foreign bodies in the antrum, other than teeth, are capable of inciting it to empyema, and I have records of a case of gutta-percha injected through a tooth root in which the antrum recovered promptly, although the duration of the suppuration covered two or three years. It seems evi-

dent to me from the cases cited and others that the antrum is not only not obstinate in resisting cure, but that it heals with great rapidity if given a fair chance.

But, it may be objected, "These are cases wherein foreign bodies are found in the antrum, how about diseases of the cavity itself?" That the antrum when clogged with pus from the ethmoid may heal is clearly shown by the case cured by Dr. Bosworth. Idiopathic inflammations, that is, inflammations resulting in empyema not caused by foreign bodies, teeth, obstructions to the orifice by polypi and syphilis, do not occur in the writer's opinion. I know this statement will be challenged, but I do not feel that it can be disproved until we can show a goodly number of cases absolutely cured by treatment directed to the antrum alone.

Necrotic Bone in Diseases of the Antrum—As a result of the last few years' work we may say that the antrum is a cavity with a natural tendency to heal; that it is frequently not the seat of suppuration, but the reservoir of other sinuses, and that its tendency to supuration is in most cases due to the teeth or allied foreign bodies. It will be noted that in the cases cited where the antral empyema had lasted many years no mention was made of necrosed bone. In fact, necrosed bone is a very rare factor in the large majority of antral empyemata. And here again we find ourselves at odds with the earlier physicians, who seemed to find it much more frequently. There are, however, two kinds of antral empyema in which necrosed bone plays quite a part, syphilis and new growths of the antrum. So common is it in these two forms, and so rare in the simple, that its existence should make the physician fear that he has a more serious case than he had suspected. Fortunately for the diagnosis of these conditions, syphilis and sarcoma or carcinoma rarely restrict themselves to the antrum alone, but send prolongations upward into the nose if they are new growths, or destroy the nasal wall or turbinates if the disease be syphilis. Another appearance which should always lead to investigation is any swelling in the walls of the antrum. Simple empyema never produces a painless swelling of walls outer or inner of the antrum. Malignant growths, carcinoma or sarcoma, will always be so in time, since the long and steady pressure acts on the walls to cut off their blood supply, and the wall is slowly and almost painlessly absorbed. From a diagnostic standpoint we have then so far simple empyema, caused by

teeth, foreign bodies, disease of the upper sinuses and malignant growths.

Dentigerous Cysts.—Within the last few years a comparatively new affection, frequently confounded with antral empyema, has appeared. Dentigerous cysts arise, as you know, about the tooth roots and slowly dilate the tissue at that point. In a dozen or so of such cases at the hospital some very interesting forms have been encountered. Dentists as well as surgeons have been misled by this curious disease into a diagnosis of antral empyema. It is not unnatural, for the face presents a swelling over the antrum, extending in some cases as far as the orbit. The tumor is hard, for its outer and inner walls are bony. It generally covers the cuspid fossa, which is often quite obliterated, and the tumor starts from a little above the level of the teeth. It seems as though the whole bony wall of the antrum was thrust outward and forward, and there is none of the soft boggy appearance of an abscess in the soft tissues covering the antrum. Transillumination sometimes gives a darker, sometimes a similiar appearance to that of the sound side. There is one symptom, however, always absent, the unilateral discharge. If we look in the nose we find no pus, no swelling of the turbinates, nor any narrowing of the lumen of the nostril. Then if we study the history we find that the swelling has lasted months or even years, and that it is not accompanied by pain or fever. We know that pus imprisoned in the antrum cannot force its outer wall forward without pain and fever, and that so steady a pressure must push the inner wall of the antrum inwards, thus obstructing the nostril. Two factors, compression of the inner wall and nasal discharge, are wanting, and so with some doubt we make an opening in the lower part of the cuspid fossa and introduce a probe. We at once find ourselves in a cavity as large as the antrum and the probe goes in nearly to the orbit. Again in doubt we syringe fluid into the cavity, but none runs out through the nose. Therefore the cavity cannot be the antrum. The dentigerous cyst forms at the root of a tooth and dissects for itself a cavity in the anterior wall of the antrum, so that the jaw contains antrum and cavity, one behind the other and often of nearly equal size.

A unilateral nasal discharge must accompany any antral empyema except that of the acute type in which the antrum is closed. Given this, we must seek to separate the antrum from other cavities and

place the responsibility for the disease on the antrum if the others are normal. This is not always an easy task and to accomplish it the dentist and the laryngologist must work together, each getting the benefit of the other's knowledge of his own territory.

Treatment of Antral Diseases.—I have gone at length into the causes of antral empyema because no treatment is of any avail unless the cause is removed. Drainage, washes and antiseptics are all powerless to do more than make the patient comfortable. Diligent search for offending teeth is of the first importance, and every root or cavity connected with a dead tooth must be explored. Even in toothless gums the X-ray has revealed roots which have caused empyema. Careful investigation as to time of origin and comparison with dental troubles at the same time will often point the way. Rubber injected into the antrum through a tooth-root and remaining in the antrum has caused the disease in one of my cases. The laryngologist should examine the accessory cavities with probe and light, and only when every possible cause has been eliminated should the antrum be opened. When it is opened, however, the opening must be a large one and generally made in the cuspid fossa. An opening large enough to admit the finger should be made and the antrum examined by touch and sight. It may then be curetted and packed, but in my opinion no drainage tubes need be introduced unless to make the patient comfortable. Any foreign body, such as a tube, will irritate the antrum, and cure will result if the cause is removed, better without than with it. If the cause cannot be found the patient may be made more comfortable by washing his antrum out once or twice a day, but it will not heal. We require and are obtaining more careful and thorough examinations and operations in both surgery and dentistry and we need to work together. As dentists and physicians grow more expert obstinate antra decrease, and I believe by cooperating we can some day make persistent empyema of the antrum a disease of the past.—*Items.*

WORDS IMPROPERLY USED BY DENTISTS CONSIDERED FROM AN ETHICAL POINT OF VIEW. By W. C. Gowan, D.D.S. Read before the Ontario Dental Society, February 11, 1903. I shall not attempt exhaustive treatment of this subject, but rather present for your consideration a few matters of ethical importance which I think have hitherto been neglected. I refer to the

words and phrases improperly used in the professional conversation of dentists, and the evil results of their use; the boasting of money made, of long hours spent in office work, and of things done in practice which are not to our credit nor worthy of our pride. I would remind some of our brethren that the differences between an ethical dentist and a quack are marked by signs other than newspaper advertising, and that these signs are seen even by people who are not dentists. I would suggest that we cease to give names to our operations in the hearing of patients, as to them names are not only unnecessary but also harmful. Names, especially short and bad names, are the support of the quack, and the basis of unprofessional competition and advertising. My purpose is not to criticise merely, but rather to help in advancing the dignity, honor and usefulness of the dental profession, by correcting the faults in language and the unprofessional methods that injure us in the estimation of educated people, and mislead instead of instructing the public in important matters of dentistry.

I believe all dentists distinguished for education are agreed that dentistry is a learned profession and not a trade. To justify public agreement in this conclusion we must speak as professional men and not as tradesmen. We must remember that a dentist deals with conditions and persons and not with things, and succeeds by the use of highly specialized knowledge and skill and not by the sale of goods. That his work is as honorable and as worthy of respect as that of any other profession should be manifest to all by his dealings, attitude, and words. The amount of his fee varies as his education, position, reputation, and circumstances, and should be proportional to the difficulty, danger, extent, importance, and success of his operation, and this all patients should be made to understand.

Since the character of dentists as a class is judged by the words and actions of the individual dentist, let us avoid a misuse of words excusable only in the illiterate, for we are estimated professionally and socially by the evidence or the lack of culture which our actions and words present, and no claim or argument will alter this evidence. What we do and say to patients is public instruction in dentistry, and upon that instruction our welfare largely depends. That the aim and moral duty of a dentist is to prevent or relieve suffering, pain, injury, disease, or loss of the organs committed to his care, and that his ability to do this depends upon his education,

should be made clear to every patient and the general public; and also that he has no merchandise to sell, does not "oppose" his fellow practitioners, nor so speak of his work to patients that they may regard him as a mere maker and seller of fillings and artificial substitutes for teeth. If these propositions are true, what view of the dignity and character of his calling, what taste, education, or common sense, does a dentist display in using the words, "price," "opposition," "customer," "business," "guarantee," "patronage," "contract," "order," "bargain," "job," "trade," "prices for fillings," "plates," "crowns," etc., "cut prices," "quote prices"? Let us examine these words singly, and their meaning to the mind of a patient or the public.

Price.—Price is used in commerce or trade in reference to things bought or sold, merchandise, property, stocks, bonds, securities, etc., and has no place in conversation between dentist and patient. Fillings, artificial crowns, dentures, etc., are not things for sale or at a price. They are merely accessories used in the exercise of a dentist's professional judgment and skill for the benefit of his patient, for which his reward in money is a "fee."

Opposition.—The use of this word, instead of fellow-practitioner or confrere, is most objectionable and impairs public respect for us. Even tradesmen refuse to use it in reference to their competitors. We oppose only that which is wrong or bad or undesirable.

Customer.—We have no customers.

Business is a broad general term covering any kind of work, transaction, occupation, or duty. It should not be used instead of the word "practice." The business of a dentist is to learn, practice and teach dentistry, and be otherwise a good citizen. His daily work is his practice. It is also the business of a dentist to take heed how he represents dentistry to the laity—whether as a trade in which quacks can compete, or as a profession in which they cannot serve.

Guarantee—Contract.—These words have a legal significance and apply properly to transactions which involve materials, labor, and things that are quite within the control of the parties interested, or between persons, as the marriage contract, or guarantee of wages. These also are within the control of the persons who make them. But a dentist cannot judiciously guarantee anything he does, except it be that a tooth extracted will not return to its place in the den-

ture, and if he enters into a contract after the manner of tradesmen he not only exposes himself to unpleasant liabilities legally, but he also takes chances against conditions he may be unable to foresee and persons he may be unable to control. Besides, a court will hold him to a guarantee or contract, however injudiciously made.

Patron—Patronize—Patronage.—Don't use these words unless you expect people to seek your services not because they need or desire them, but only to give you encouragement, countenance, or money. A patient should be presumed to consult her own interests in her choice of a dentist.

Order.—Since we perceive by means of highly specialized knowledge the needs of our patients, it follows that our judgment in most if not all, cases should prevail. Hence, to obey or permit orders from patients generally is absurd and wrong. It may sometimes be unlawful also.

Trade.—To use this word in reference to our practice is to deny all the propositions before set forth. He who uses it denies his professional status and dignity altogether and teaches the public to do the same. The attempts to make dentistry a trade is quackery or folly.

Job means "a petty piece of work undertaken for a specified price." Job is worse than trade. Job suggests, "To half-soling shoe, 50 cents." "To hair cut, 15 cents." "To hinge on gate, 30 cents."

Bargain has no place in our vocabulary. If for the sake of charity or for any other reason you are willing to accept less than a sufficient fee, let it be so understood, that you may have the patient's gratitude. Don't say bargain unless you wish the public to think you a common trader who sells things.

Prices for Fillings, Etc.—Cut Prices—Quote Prices.—This phraseology is wholly wrong in principle, word, and idea, damaging to ourselves and misleading to the public. Nor is it bettered by substituting fee for price, for cavities so differ in position, extent, difficulty, complication, and expense of time, energy, and skill in dealing with them that we could not quote a just scale of fees for "filling" them, even if we should choose to ignore the principle that we charge for professional services and not for fillings. To base our charge on time only is no better. To charge for the operation as a professional service rendered

is our only proper course, whatever the amount may be. It is therefore clear that he who practices dentistry professionally can quote neither prices nor fees, no more than can the physician. Each practitioner expresses the value of his services by the fees charged, and whoever charges less than his confreres, circumstances being equal, acknowledges himself inferior to them. Whoever says or acknowledges cut prices in reference to himself or his confreres invites public contempt for dentists and dentistry, and makes easy the way of the quack. To use this phrase is to acknowledge the competition of the quack and help him before the public.

"Replate or reset teeth," "put up a set," "take the impression," "permanent plate," "kill the nerve," "cap the nerve," "cap the tooth," "crown the tooth," "freeze the gum," "cure a gum boil"—these expressions have cost us money and respect, and have sent more people to the charlatan than all the advertisements ever printed. To say that you will "replate a set of teeth," when in fact you intend to construct an artificial denture, using teeth from an old or broken one, is to cheat and belittle yourself and to mislead your patient. The very word replate is short and commonplace, and leads the patient to estimate the operation as a trivial matter of transferring teeth from an old plate to a new one, for which very little money should be paid.

"Put up a set" is no better, and "take the impression" is used by the dentist and repeated by the public as if nothing else but an impression were necessary, and that from it a full denture is cast, like bullets from a mould. Name all the steps or none, and don't thus mislead people to your own disadvantage.

Permanent Plate.—This is open to serious objection, for the continual change, due to absorption of the alveolar process when the teeth are lost, makes a permanently fitting denture impossible. Cut permanent out altogether. Its use misleads the patient. Artificial denture or artificial teeth should suffice.

Kill the Nerve.—There is no expression among all the bad ones so improper, undignified, and badly descriptive of the operation as this. To call the pulp of a tooth "the nerve" is to display ignorance of which a dentist ought to be ashamed; and to say "kill" when you mean "devitalize" or "destroy" is as vulgar as "rip the belly," if used by the surgeon respecting an abdominal section.

"Kill" and "rip" are quite proper for butchers, but not advisable for doctors. Housekeepers kill rats and mice with a few cents' worth of poison, and little or no anxiety or skill. If a dentist devitalizes the pulp of a molar with arsenic, removes it, and fills the roots in an aseptic condition, in three sittings, and calls his operation "killing the nerve," his patient will estimate and pay him about as she does her washer-woman for the work of as many hours. It is no wonder so many patients think there should be little paid for an operation called by such a name. "Devitalize and remove the pulp and fill the roots" is surely not too long a statement.

The same reasoning applies to "cap the nerve," "cap the tooth," "freeze the gum," "cure a gum boil," or "crown the tooth." These expressions are alike in their improper, undignified, and un-descriptive brevity. They set forth the operations for which they stand as commonplace tricks of a trade, just the things for which a quack can "quote prices," and worthy of little money or respect, like the man who uses them. When you describe or speak of your operation to your patient, use a few minutes of your time to describe it properly, and don't allow anyone to use these expressions in your hearing without immediate correction. If people were instructed by their local dentist concerning the cleanliness, knowledge, skill, honesty, and care which are necessary in a successful operation, they would never go to a quack. To so instruct the people care in our words and respect for our operations and ourselves are necessary. If you don't want to help quacks, don't give short, un-descriptive names to your operations. Don't itemize fillings, crowns, extractions, cleaning teeth, devitalizing pulp, etc., with a definite charge for each item, for your patients, but make judicious use of the words "professional service" (in rendering account), "operation," "treatment," "dressing," "prevent infection," "relieve pain," "remove the cause," "prevent caries," "management," "restore," "repair." Use such words as these in their proper sense. They make clear to the patient that professional skill is necessary, and you need not fear that a quack will adopt them. He can't use them in advertising or "price cutting."

Repair means to restore to a good, whole, or sound state after injury, dilapidation or decay, to mend, to renovate. No word is more useful or better understood by all people. It has a comprehensive meaning, and is, I venture to think, more appropriate,

descriptive, clear, and elegant than "fill," "plug," "crown," or "cap." No display of technical language is necessary or advisable if you use common sense in choosing words. But don't choose these words: "Silver," "composition," "porcelain fillings," "Justi's or White's teeth," "best sets," "examination free," "treatment free," "extracting free," "use cocain." This is decidedly unethical language. If you must name the material with which you fill, why not honestly say "amalgam" and "cement"? And why should you make trouble for yourself and all of us by advertising among your patients the name or product of any manufacturer of dental goods? When you say "best set" you imply that the only difference between one artificial denture and another is the cost or quality of the teeth. To declare your examination free is to declare your professional knowledge and opinion worth nothing, like that of the oculist in the jewelry store. "Treatment free" is in the same class. "Extraction free" implies that you are glad to see teeth lost, and are doing all you can to encourage extraction. It also shows that the operation costs nothing, is of no importance, that a dentist will extract for fun.

Cocain is a seductive and dangerous narcotic; therefore do not name it or let your patient know you are using it. By this course you will avoid not only unpleasant symptoms aroused in the patient by fear, but also the possibility of initiating the cocain habit. The same applies to morphia.

In another class we have "ulcerated tooth," "dead tooth," "rotten tooth," "hollow tooth," "hole in a tooth," "matured at the root," "false sets," "dose of gas," "pull," "yank," "draw," "scrape out," "stump," "fang," "snag," "doc."

An alveolar abscess is not an ulcer, nor is it a disease of the tooth. It is a disease of the tissues outside and beyond the tooth, caused by infection from the apical foramen. A pulpless tooth is not necessarily a dead tooth. A dead or rotten tooth would soon be cast off by the living tissues. All normal human teeth are hollow, and to say "hole in a tooth" when you mean carious cavity, is to be inaccurate, as well as vulgar, for all holes in teeth are not carious cavities. People can learn the meaning of caries as easily as they learn the meaning of measles, smallpox, or appendicitis, and a lesson from the dentist in this would be worth more than a crown. The next three phrases need no discussion. But a dental surgeon who

can properly extract a tooth knows that neither a pull, a yank, nor a draw will accomplish this purpose; and he who can properly clean teeth will not say "scrape," nor will he say "stump," "fang," "snag," or "doc."

"Complaint is the largest tribute Heaven receives and the sincerest part of our devotion." Yet I must complain again that this language is unfit for students of science. Are "price," "opposition," and "kill the nerve" words becoming a doctor of dental surgery, a teacher of the people? Are these words an expression of that exalted view of dentistry which we should entertain? Do any of the words I have criticized express or even suggest the nobility or the dignity of a worthy dentist's ambition? Do they suggest that a dentist hopes and labors for rewards other than mere dollars and cents? Are they marks of culture by which the social interests of the dentist are advanced? Are they even suggestive of accomplishments worthy of a respectable fee? Our words should suggest these things.

To those who are not fond of reasoning, but prefer specific advice, I would say: Boast of the money you make. In towns say \$4,000 to \$6,000, in cities \$10,000 to \$20,000 a year. Boast that you work in your office every night till ten o'clock, also Sundays, and that you do a great deal of crown and bridgework—in fact, that you "make a specialty" of it. The first boast will arouse the envy of your neighbors; make them suspect dentists of greed and extortion, and pay your fees unwillingly. It will also induce young men who want to get money quickly to study dentistry. Your second boast will show that you are a grovelling tradesman, who has no time or desire to read, no interest in education for the duties of a good citizen, that you care for nothing but money, are not a professional man, and ought to be called "doc." Your third boast will make it probable that you know little and care less about conservative dentistry, being more interested in the sale of crowns and bridges than in rendering them unnecessary. Hence you are not to be trusted with the care of children's teeth. Fit up your laboratory with a two-horse-power motor, big plate rolls, all the porcelain furnaces made, and other machinery. Hire three men. Say you introduced crown and bridgework and continuous-gum work in Canada; that you do this work for other dentists. Show people your laboratory. They will think dentistry can be done in a mill by

divided labor and machinery; that you are a pretentious extortioner, boasting now of your crowns and bridges, whereas a few years ago you boasted of the teeth you pulled and the sets you made, and that you make not honored the name of dentist. Always speak of your fellow-practitioner in town as "my opposition." Talk about your prices, guarantee your work, invite patronage, give bargains, do jobs, make contracts, replate teeth, kill nerves, charge for gold fillings by the leaf; give names to all your operations. Say "false teeth don't ache," and if there is an ethical dentist near you say "His prices are too high." This will lead people to various conclusions; whereof one will be that you and the quack are equal in language and method, even if you don't "advertise," the choice between you being a matter of dollars and cents only. Another will be that dentists are a body of illiterate mechanics, who ought to be treated accordingly.

Never read dental journals or any literature, excepting price lists of teeth, rubber, gold, etc. Don't take a post-graduate course or otherwise learn to make an artificial denture worth more than \$8.00, a filling operation worth more than 75 cents, management of alveolar abscess, therapeutics, root-filling, or any such thing. Be candid, and tell dental students that money is what you seek first, last and always. If your father is a talkative man and not a dentist, invite him to your office, show him all the brass crowns and bridges you made (or bought) at college, and tell him they are for your patients next day at \$10 per tooth. Your wife will do if your father can't come. In rendering account, don't mention professional services, but specify each item separately by name, and at a price, as blacksmiths and plumbers do. This will show how you compare with the "real painless," besides teaching people that the work of a dentist is mere trade.

Before closing, I would ask: Is crown and bridgework the achievement of which a dentist ought to boast, and by boasting teach the people to expect it as a panacea? "Teeth without plates!" With all the recent increase in scientific knowledge and improvements in education and methods, can a dentist do nothing more worthy of special mention and pride? Would it not be more becoming in us and instructive to the public to boast that for young people who secure our services in time no crowns or bridges will be necessary? Or to faithfully do something to justify the words of

Oliver Wendell Holmes, when he said: "The dental profession has established and prolonged the reign of beauty. It has taken from old age its most unwelcome feature, and rendered enjoyable human life far beyond the limit of the years when the purblind patriarch might well exclaim, 'I have no pleasure in them.'"

It seems that commendable ambition and a sense of beauty, truth, and dignity must be developed in a man before he will prefer the language, manner, and style of dealing deemed professional. But surely it is not too much or too soon to ask that the grosser errors be avoided even for the sake of our social and financial interests, for unless the majority do this, the name of dentist will not be deemed a guarantee of learning, culture, good taste or professional character. Improvement is progressing however, and if I assist in it even a little I shall not have written in vain.—*Dominion*.

DR. BLACK'S THEORY OF EXTENSION FOR PREVENTION. By Henry L. Banzhaf, D. D. S., Milwaukee. A careful study of the literature upon this subject reveals the fact that from the time Dr. Black first presented his theories upon "The Management of Enamel Margins" in a series of articles published in 1891 to the present day, there has existed a wide difference of opinion as to the meaning of the term, "Extension for Prevention." These differences of opinion are in such marked contrast to the "Teaching of Black" that one is forced to believe some of our writers have a more or less imperfect idea as to what he really does teach. In order that there may be no misconception, the writer at the outset desires to define his own interpretation of the meaning of this term. I do not believe that "Extension for Prevention" means a ruthless cutting away of healthy tooth structure merely to prove a theory, or that every cavity presented shall be converted into one having a great depth or great surface area; but it does mean, as a general rule, that a cavity shall be so prepared that when the operation is completed the gingival enamel margin is well covered by healthy gum tissue, and the "margins approach the angles sufficiently to free them well from near contact with the proximating tooth." In other words, there should be no cutting around the angles of a tooth on to the buccal, labial or lingual surfaces, unless decay is sufficiently extensive to warrant this procedure.

The subjects of caries, recurrence of decay, and immunity, are so

vast that I feel obliged at this time to confine myself more or less rigidly to extension principles in cavity preparation, and the results of subsequent correct restoration. With this end in view, and in order to facilitate an intelligent study of this subject, I shall divide cavities requiring extension into two classes: First, pit and fissure cavities; second, smooth surface cavities. The first class of cavities occurs upon the occlusal surface of molars and bicusps, the lingual surface of upper incisors, and sometimes upon the lingual surface of the upper molars. These, as we know, are grooved surfaces, and, except for the deeper grooves, pits or fissures, are kept smooth and clean as a result of friction in mastication. It is a clinical fact now past all question that such surfaces never decay unless there is a structural defect in the enamel, which invites the lodgment of food, retains it, and as a result of the fermentation which follows we have decay. In preparing these cavities for filling not much "Extension for Prevention" is needed, because the enamel surface which surrounds the cavity is kept clean mechanically. It is not infrequent, however, that a pit and fissure cavity may include a considerable area in the dentin without destroying much superficial enamel. This is undoubtedly due to the fact that this smooth, polished surface is practically immune from decay because it is kept clean, and but for the enamel fault referred to would remain so. The requirements are therefore simple, and consist in cutting away of all over-hanging enamel walls, the removal of decay, the cutting out of deep grooves to points where a smooth finish can be made, and the proper beveling of margins to admit of the perfect finishing of the filling.

In studying smooth surface cavities we find, first of all, that the beginning of decay is not due to imperfect enamel formation, as is always the case in the pit and fissure cavity; hence it follows that as the beginning of decay differs in its origin, the underlying principles which govern the treatment of smooth surface cavities must vary in like manner. Let us take a case in practice, and suppose that we find a cavity on the buccal surface of a molar near the free margin of the gum, or one on the labial surface of an upper central incisor, for the conditions are much the same. A careful study of the history of these cases will show that we find the first evidence of decay in a narrow, crescent-shaped strip of whitened enamel, which at this time usually finds its boundary gingivally at the free margin of the gum. Here we have to deal with decay which occurs in a

region which is not kept clean by friction in mastication, and it will also be noted that the progress of decay is most rapid in the center of this unclean region, and diminishes in rapidity as we approach a surface which is more or less immune to the ravages of decay because of its cleanness. The natural deduction, therefore, is that where there is no pit, no fissure, no fault in the enamel, the surface which is continually unclean is most susceptible to decay, and that the extent of decay will correspond with this line of uncleanness.

The preparation of these cavities is more or less a matter of judgment with each individual operator. The object in view, of course, is the prevention of recurrence of decay, and his success will be in direct proportion to the correctness of his judgment in deciding what shall be done. In determining the outline of the cavity the susceptibility and age of the patient should receive especial consideration. For this reason it is absolutely necessary that we carefully study the conditions surrounding each case, especially with regard to this region of uncleanness, which varies materially in different patients, always keeping in mind that in order to effect a permanent cure the removal of the conditions which led to the beginning of decay should be accomplished. Having decided this much, the necessity for removing all of this region which is not clean becomes at once apparent. This procedure often includes the cutting away of dentin which is perfectly sound and healthy, and this should be done without hesitation. The occlusal margin of the cavity should be as near the occlusal as the requirements for having a surface which shall be kept clean by friction may demand. The gingival enamel margin should be laid far enough under the free margin of the gum, to the end that a reasonable absorption of the latter shall insure it against exposure. The mesial and distal margins should be as near the mesial and distal angles of the tooth as sound judgment may direct. This form of cavity preparation has often been termed exceedingly radical and cruel. It certainly is not more radical than is called for by the exigencies of the case, and with electricity at our disposal as a means for relieving pain it need not be cruel. The results depend upon the earnestness, skill and judgment of the operator. I have said this before and I repeat it.

In studying proximal cavities in incisors and cuspids, it is important for us to understand that clean surfaces of teeth do not decay, and that wherever we find decay on proximal surfaces of teeth it is

always because the surface affected is not clean. On close examination we again find that, whether the cavity be large or small, its boundaries of corrosion, superficially, are limited to this region which is not kept clean. Decay never begins on a surface which is covered by healthy gum tissue, and when found there is solely due to neglect in treating the initial point of enamel penetration.

With regard to this area liability I can do no better than to quote Dr. Black's own words: "The proximal area of liability to decay is bounded to the occlusal by the proximate contact point, to the buccal or labial and lingual by the opening of the embrasures to the excursions of food during mastication, and to the gingival by the position of the margin of the healthy gum septum." This definition of the area of liability in itself points out the treatment. In deciding upon the outline of the cavity all of the area which is liable to decay must be included. Unless this is done the operation can be considered of only temporary benefit. The conditions governing each individual case must of course always guide the operator, as for instance, in a patient who has passed the age of forty liability to decay decreases with advancing years. Any operator of ordinary experience, who will carefully study this subject of liability of decay, and who will apply the rules of ordinary common sense, will have no difficulty in recognizing these exceptions, and thus give his patients the benefit of that judgment which they certainly have the right to expect.

In securing the outline of proximal cavities in incisors and cuspids the gingival enamel margin should also be well under the free margin of the gum. This requirement, which under normal conditions in youth and even middle age is quite easily accomplished, seems to be a bugbear to many. It is urged that this involves too much destruction of tooth structure; that the gum septum in the interproximal space, when it approaches the contact point, is wounded and lacerated both in the preparation and in the finishing of the filling to such an extent that premature atrophy of the gum tissue is the result. In answer to these assertions, I am bound to say that the first objection is not a valid one, because when the gum septum occupies its normal position in the interproximal space, during the period of high susceptibility, not much cutting rootwise is required in order to safely place the gingival enamel margin where it becomes practically immune from recurrence of decay. The second objection can be overcome more easily. All that is needed to protect the gum

tissue from laceration is a little painstaking care and sufficient time in which to press it away temporarily from the surface requiring treatment, by the manner of adjusting and the judicious assistance of compression by cotton for a few moments. Gutta-percha packed into the cavity and extended across the interproximal space may be used temporarily for any necessary purpose, provided sufficient room be given the gum tissue to prevent great absorption. This is readily and quickly done by placing any kind of hand matrix or narrow spatula in the space to prevent too great compression of the soft tissue.

Fillings often fail as a result of imperfect consolidation, of the material used, imperfect adaptation of the material to the walls of the cavity, faulty restoration, and defective finishing of the filling when completed. Therefore I desire to lay particular stress upon this one fact, that in speaking of recurrence of decay I have in mind that condition which occurs as a result of the entire absence of or insufficient extension of the cavity in the direction of the root. Under such conditions decay will occur, and usually at the labio-gingival and the linguo-gingival angles. As a prophylactic measure the cavity should be broadened at these points, and the angles left nearly square, taking special care that there is no contact with the adjacent tooth.

As has been previously stated, the cutting away of the labial surface of an incisor or cuspid should never be tolerated unless extensive destruction of tooth structure makes this necessary—first, because nothing is gained, and second, because it is thoroughly unscientific. Strange as it may seem, it is nevertheless true, that many dentists today still believe that by extending a cavity as far as the mesial or distal labial groove, they have practiced "Extension for Prevention." Whereas, as a fact, they have by so doing extended beyond the angle which is the region of greatest safety to a region of less safety for the enamel margin.

The display of gold should of course be avoided whenever possible, and in earnestly striving for the beautiful much can be accomplished. In alluding to the cultivation of the esthetic in our patients, permit me to add that with the advent of porcelain as a filling material, its undoubted compatibility to tooth structure, the immunity it affords, the dentist of today can, if he but will, cope successfully with unusual conditions in cavity preparation. Especially is this true in treating teeth of children, or in any case when from choice,

lack of physical vitality, or for esthetic reasons the use of gold is not indicated.

Many of the rules which apply to cavity preparation in the preceding classes apply to proximal cavities in molars and bicuspid. In these teeth, as in all proximal surfaces, the region which is most susceptible to decay is "gingivally of the contact point," and extends slightly on to the buccal and lingual surfaces, with a decided tendency rootwise at these angles. The basic idea is that whatever extension at the gingival toward the buccal and lingual is necessary, in order to safely place the margins in a region that may be called self-cleansing, must be carried out to the occlusal. And again I want to emphasize the fact that, while it is necessary to extend the cavity sufficiently to prevent contact with the adjacent tooth, scientific extension of cavities does not mean that the enamel shall be cut to the angle of the tooth or beyond it.

The extensive cutting away of buccal or labial surfaces is excusable only by reason of great inroads made by decay, and for that reason I believe that the necessity of so changing the conditions that all of the regions most liable to decay will be included should appeal to every careful observer. It must always be borne in mind that correct cavity preparation calls for the application of the principles of prophylaxis. If we desire to cure we must also see to it that we do not invite pathological conditions of the gum septum and the periodontal membranes that will become progressive and destructive.

In this connection I desire to speak of the form that should be given these proximate fillings. The original form of the tooth, if it was normal, should be restored. It is of the greatest importance that the full diameter of the crown of the tooth, from the mesial to the distal, be preserved. Indeed, this rule applies to all teeth requiring restoration. Unless this is done the interproximal spaces at once become contracted, resulting in tipping of the teeth, a condition always deplorable on account of the difficulty with which the interproximal spaces are kept free from the lodgment of food.

In conclusion, I believe that the doctrine of "Extension for Prevention" is absolutely sound, and while men may differ in minor details, and admitting that the theory has had some very able opponents, yet despite all this the painstaking, progressive, conscientious dentist, striving for high ideals, has found it a beacon light and a powerful factor in raising his standard of excellence in operative procedure.—*Dental Forum*.

NECESSITY OF GOOD VISION IN OPERATIVE DENTAL WORK. By Wendell Reber, M. D., Philadelphia. The necessity for good vision in operative dental work is so very apparent that it seems needless to enter upon a consideration of the subject, yet I venture to direct your attention this evening to the matter for two reasons: first, because the idea as to what is good and comfortable vision is but a vague and hazy one to all minds except those that have studied the physiology of the eye; second, because in operative dental work the visual apparatus is pushed to its fullest powers by reason of the close range at which such work must be done. This paper therefore naturally falls into the discussion of the two questions, "What is good and comfortable vision?" and "What is the relation of the visual apparatus to operative dental work."

In answer to the first part of the first question, good vision may be defined as the ability of the eye to meet without any straining the visual tests based on the examination of many thousands of normal eyes. The expression "without any straining" means that there shall be no adjustment of the focus of the eye—that in a state of rest it readily sees the line of letters that indicate normal vision. Now, by an unconscious adjustment of the focus of the eye, such as is constantly going on in the eyes of all far-sighted people, it is possible for the eye to correct its own errors, and such people (far-sighted), seeing the normal line of letters at the proper distance, imagine their vision is perfect and insist on contributing this information to the oculist when consulting him, never realizing that their seeming perfect vision has been accomplished by a strain which, though they may not be conscious of it, is nevertheless going on every moment their eyes are open.

What has been thus far said refers only to good vision as found in each eye by itself. What is of vastly greater significance is how do the eyes work together as a pair; for each eye individually may be of perfect focus, and yet, if they do not work smoothly together as a pair, vision while good will not be comfortable, and any extended use of the eyes at a distance nearer than twenty inches is reasonably sure to bring about more or less distressing symptoms. This relation of one eye to the other naturally brings up the question of binocular vision, for it must be distinctly understood that the

eyes are not independent organs, but are only the visible ends of a marvellously constructed structure known as the visual apparatus.

For a clearer understanding of this intricate subject it is well to remember that the eyes are merely two globular cameras positioned well forward in the head that they may better sweep almost the entire horizon without moving the head. These cameras are so swung in their delicate muscular harness that they may be always simultaneously directed at the object observed, for if one of them should fail by one twenty-fifth of an inch to keep pace with its neighbor double vision would result. This fusing of the images from these two cameras (or eyes) into one image by the brain is what is known as binocular vision. The structures concerned in this act are the eyes, the visual centres in the brain, and the path connecting the eyes with the brain. It is well to also bear in mind that for the proper functioning of this apparatus all of four and part of another of the twelve cranial nerves are called exclusively into play. With these facts before us, namely, that for the proper accomplishment of binocular single vision there is reserved a considerable portion of the brain cortex—a large portion of the structures at the base of the brain and more than one-third of all the cranial nerves—it is easy to understand that binocular vision is one of the most complex of the various automatic actions acquired by the human organism.

As to the second question, "What is the relation of the status of the visual apparatus to operative dental work?" it will be wise to consider this phase of the question under the following heads: 1. The character of the work done. 2. The position assumed in work. 3. The illumination. 4. Hours of work. 5. Personal habits. 6. The use of glasses. As to the character of the work, I am informed that operative work is usually done at a distance varying from ten to twenty inches; that it is usually rather minute in character; that it has to do with fine edges and excavations demanding most accurate sight; that a constrained position of the head is sometimes required for ten to fifteen minutes at a time; that a view of the field of operation is frequently obscured by the instruments used, and that all this must be done through an opening varying in size from one and one-half to two and one-half inches.

Considering all these factors, it is apparent that for the sake of the work as well as the eyes the illumination should be the very

best obtainable. For centuries it has been known that the dimmer the light the nearer the eye must be to the work done. It is the only way left to nature to overcome the disadvantage. So that it can be said in a general way that the work of healthy eyes will be easy or difficult, unconscious or labored, according as the illumination is sufficient or not. Closely bound up with the matter of illumination is the position assumed in operative work.

In no way is the visual apparatus more persistently abused than by continual use of the eyes at too near a point—a habit into which it is very easy to fall. Especially does this habit seem to threaten dentists, for by the nature of their work they want from time to time to minutely inspect the progress they are making and instinctively approach it as closely as possible, thus putting both the focussing and the converging portions of the visual apparatus to a severe strain. It is well to also remember that much bending over the work favors undue accumulation of blood in the delicate eye tissues, and may lead to grave changes in their structure.

This brings us to the matter of the number of continuous hours the eyes are used each day. Most any eyes can stand the finest, closest kind of work for a quarter or a half-hour. Indeed, the endurance of the eye is almost directly as the fineness of the work. Therefore, if the dental surgeon is doing any particularly fine close work with the eyes they should be rested from time to time by directing the gaze out into space, or better by closing them for from five to ten minutes two or three times a day. Physiology's greatest law provides for alternate periods of work and rest. There are few dentists' eyes which are not exerting some slight effort every moment they are open, even if they are not employed at close work. Hence the need of the short period of rest just mentioned. Best of all rests is a temporary relaxation of all the energies of eye and mind in a short period of exercise in the open air. The good effect of a short recess on school children is a matter of every-day observation, and after all we are only children of a larger growth.

All that has gone before refers to the discomfort that may ensue in perfectly normal eyes. If the dental surgeon has any fault of focus in the eyes, or of adjustment of one to the other, he will do well to consult a skilled ophthalmic specialist. I am fully conscious of the antipathy of dental surgeons in general to the putting on of glasses in their work. They imagine patients will infer their sight

is on the decline and their work will suffer in consequence. I have heard such admissions from the lips of a number of your guild, and yet it is hard to put down the thought that one's clientele will appreciate his desire to do the best possible work by giving every aid to his sight. The evolution of society and science has been faster than the evolution of the eye. In time to come the eye will meet the heavy demands now made on it in all kinds of near work, and people will be born with eyes equal to the demands of their day. Until that distant day, however, correcting glasses will have to be resorted to by those who are compelled to use their eyes many hours a day at a distance of twenty inches or nearer. And, if I mistake not, there are many dentists to-day, philosophically suffering from headache, neuralgia, dizziness, drowsiness, sensitiveness to strong light, blurring of the sight in reading or operative work, abnormal physical tire after two to three hours' work, who, if they but availed themselves of the aid that ophthalmic science holds out to them, might be freed of these elements that are productive of so much of the friction of daily life.

Lastly, personal habits count for much. Nothing predisposes more to eye-tire than late hours or other dissipation. Not only does the eye suffer along with the rest of the body in the general lowered tone, but it has been plainly shown that alcohol has a directly harmful effect on the optic nerve when this susceptible bit of tissue is not having its regular supply of good, nutritious blood. Tobacco is even more harmful. Let this not be misconstrued as a tirade against smoking, for the writer is himself a votary of our Lady Nicotine. Moderation is the virtue that saves. Men of active out-door lives can smoke almost *ad libitum* all their lives without the least bad results, but men of sedentary lives or nervous temperament will wisely learn the limit to which they can go. Individual susceptibility counts for much, and what for one man might be the extremest moderation might easily in another man prove the one factor needed to ruin a pair of optic nerves already struggling hard to meet the labor daily laid upon them.

As a profession dental surgeons use their eyes hard. It therefore behooves them first to see that their vision is perfect or as nearly so as it can be brought; and second to have a care that their work is done under good illumination, without bending too much over it, and not too many continuous hours.—*Brief.*

BACTERIA, THEIR RELATION TO INFLAMMATION IN GENERAL AND ESPECIALLY TO INFLAMMATIONS IN THE MOUTH, WITH REPORT OF A CASE OF ALVEOLAR ABSCESS AND ITS TREATMENT. By D. E. Keefe, M. D., Springfield, Mass. Read before the Valley District Dental Society, Feb. 16, 1903. It has been said that all objects, both animate and inanimate, all forms of life consist of an aggregation of cells, the different forms being determined by the closeness of the connection and the freedom of motion existing between the component cells. Aside from those entering into the formation of the human body, there is at present none commanding the attention bestowed upon bacteria. This may be readily understood when it is appreciated that they are omnipresent. They may be found upon the earth and in the waters under the earth, as well as in most other things, both visible and invisible. We breathe them in the air, we eat them with our food, and drink them with our water, to say nothing of our other beverages. They are the causative factors in most of our diseases and per contra they prevent many diseases. They digest our food and ferment our beer. There are two distinct classes of them, the one pathogenic, the other non-pathogenic; the one producing disease and toxemia, and the other antagonizing and neutralizing or minimizing the efforts of the first.

The subject of bacteriology and the kindred ones of toxemia or of toxins and antitoxins with their serums, form the most important and interesting theme that can occupy the attention of thinking men. But to dentists and physicians, whose daily work brings them in close touch with both the germs and the results of their destructive action, it should be especially interesting and all-important. Upon their history and known life-work hinges the whole subject of infection, asepsis, and antisepsis. Indeed, so complicated is their work and so manifold their forms, genera, and species, that whole volumes could be written on any one of its phases. One cannot avoid the conclusion that the writers of most text-books, of a more or less technical character, being themselves specialists upon the subject allotted them, assume too great a knowledge upon the part of their readers. It is for this reason that they waste hours of valuable time and pages of paper in discussing moot points, whereas we often look in vain for a simple definition or a plain statement of elemental facts.

In the remarks that are to follow it is not intended to say anything

either essentially new or startlingly original, nothing but what is as familiar to each and every one of you as to the writer. Let us reason together and refresh our memories, hoping that one or two facts may be presented in such a manner as to stand forth in bold relief and prove of importance and value to us in our every-day work. We need not go into the various classifications of bacteria; suffice it to say that they are all vegetable organisms which contain no chlorophyl, and hence are not green. They are like our anatomy, variously named from their form, appearance, and from the diseases of which they are causative factors, the words germs, bacilli, micrococci, and bacteria being rather loosely used to denote any or all of them and as synonyms, although they are strictly speaking, nothing of the kind. The bacteria include the fungi, alga, moulds, and yeasts; are generally asexual, and multiply either by fission or dividing, by spore formation, or by sprouting. We have the micrococcus or round, the streptococcus or chain, the staphylococcus or clusters, the diplococcus or pairs, the tetragemnes or quartet, the lanceolate or lance-shape, the spirillum or spiral-shape, and the bacillus or straight, like a rod or pole, and many more that might be mentioned. Of those named from the diseases they produce may be mentioned the bacillus of typhoid, tuberculosis, tetanus, etc. Most of the bacteria cannot multiply in the air, and but few can live in it and retain their virulence for any length of time. When exposed to the air they gradually lose their virulence and in time perish. It is for this reason that in many cases fresh air and sunlight are the best antiseptics. Notwithstanding this, it has been demonstrated by Haegler and Vaughn that the streptococci may retain their vitality and power of development in the air for thirty days, staphylococci for one hundred days, and the typhoid bacilli for several months. These facts should impress upon us the importance—indeed the duty—of burning all things of little value, as cotton, wool, etc., that have come in contact with patients having any infectious disease of the mouth, and carious or suppurative process. The instruments and all valuable articles that boiling will not destroy should be boiled for twenty minutes. We should also appreciate the importance of rendering our hands aseptic after handling the mouth of one patient before touching the next.

It may be pertinently asked, if all nature is permeated with bacteria, if we are environed by them, why do we not more frequently become infected with the diseases they are supposed to induce?

While it is perfectly true that the surface of the skin and the various mucous membranes form accessible portals of entry for them, it is also true that nature, ever on the alert for the conservation of the species, has furnished various and efficient means for our protection and preservation. The flattened and thick scales of the epidermis and the squamous epithelial scales covering the skin and mucous membranes, supplemented by the round cells of the deeper air tubes, respectively offer an almost impenetrable barrier to the passage of the bacteria. Again, the tortuous arrangement of the upper air passages filters out most of them, while the epithelia and their cilia ever in motion in an outward direction aid in driving them out. These efforts are supplemented by the secretions of the glands of the mucous membrane and lymph and salivary glands, all tending to drive and wash them out.

The skin and mucous membrane are seconded in their efforts by the natural bacterial flora of all parts of the body. In other words, the resident bacteria, and there are such occupying all parts of the body in health, immediately antagonize the invading germs, and a battle ensues. The resident bacteria are aided in their battle by the white blood-cells and the bactericidal properties of the lymph and blood streams. In health the united forces of the system, plus the resident bacteria, prevail over the invaders and they are destroyed and thrown out. Although bacteria are capable of entering at any portal and of producing infection in any part of the body, yet some are restricted to certain modes of entrance and to certain parts or regions of the body; examples are the gonococcus and the bacillus of tetanus. The delicate covering of the tonsils and of the follicles of the intestines make them especially vulnerable points for bacterial attack, and so they are frequently attacked, and are often the seat of primary infection, as in diphtheria and typhoid fever.

The obstruction of the ducts of the salivary glands and of the biliary and pancreatic ducts predispose to infection, since ordinarily the germs would be discharged with their secretions. Of almost equal importance with the defences just enumerated are the bactericidal properties of the cells and fluids of the tissues of the body. These properties depend partly on chemical qualities, as of the gastric juice and its acid secretion, but mainly upon the bactericidal properties of the living cells and fluids which in health offer a vigorous and successful resistance. This quality is not limited to the lymphat-

ics or to any particular organ or tissue, but resides in the cells and the products of their metabolism. It is everywhere present in the blood throughout the body, but is more highly developed in some places than in others. The question as to whether the bacteria could penetrate the skin and healthy mucous membranes was for a long time *sub judice*. At the present time it is generally conceded that apparently they can and do penetrate the skin and are taken by the blood and lymph currents to the deeper parts, there to remain latent. This is called latent microbism. A blow or any injury to the soft parts, a fractured bone, or traumatism of any kind, by establishing a *locus minoris resistentia*, or in other words, anything that lowers the vital resistance, and immediately we see the manifestations of their presence, by suppuration in connection with a simple fracture, a cold abscess, or a tubercular ulcer in the soft parts. So also is explained the infection of typhoid fever and tuberculosis.

I have before referred to the fact that all parts of the body are in health occupied by bacteria, these being for the most part non-pathogenic, though we find also a few pathogenic. The non-pathogenic do no harm but under exceptional circumstances. On the contrary, they are frequently highly important in helping the various organs in the performance of their allotted tasks and in keeping out invading pathogenic germs; thus is the digestion and liquefaction of our food aided by the ferments found in the stomach and intestinal canal. The mouth being the portal of entry for food and drink and frequently for the air we breathe, and these being charged, more or less, with all kinds of bacteria, one would naturally expect to find the mouth the temporary or permanent abode of many organisms, and so it is. Miller has isolated one hundred species of bacteria normally found in the mouth. Of course most of them are non-pathogenic. Of the pathogenic bacteria found normally in the mouth of healthy persons I may mention diplococcus, streptococcus pyogenes, the staphylococcus aureus and albus, the oidium albicans, actinomyces, coli communis, the bacillus of diphtheria, typhoid, and many more. Your professional interest being centered in the mouth, I shall not enter into the consideration of the other parts of the body or their bacteria.

Now a few words on the subject of inflammation. Every tissue of the body may be the seat of inflammation, and the inflammation of each in form and product is more or less peculiar to itself and differs from that of all other parts. The inflammations of all tissue resemble

each other in that they all tend to repair and cannot differentiate. That is, injuries to tissue, whether of lung, liver, intestine, or brain, are all repaired by what is called cicatricial tissue, and never by replacing the brain, lung, liver, or intestinal tissue destroyed. The new tissue has none of the properties or functions of that it replaces. After periosteal inflammations, however, the destroyed bone is frequently replaced.

On the other hand, the kind, course, and product of an inflammation is governed by the character of the microorganism acting as its etiological factor, each kind or species producing an inflammation in kind and product that differs from all others. Thus the Klebs-Löffler or diphtheria bacillus, as well as the *oidium albicans*, produces an exudative or membranous inflammation. The microbe of syphilis (unknown), the bacillus of tuberculosis, and the *actinomyces* change normal into granulation tissue by proliferation, producing periarteritis, periostitis, and gummata. They also induce a periostitis and caries in bone, and their processes are usually chronic. The pus cocci, the colon and typhoid bacilli produce suppuration in bones and their envelope as well as in the soft parts, and their processes are generally acute in character. The yeasts and moulds set up a proliferative inflammation and destroy parts, provoking ulceration by depriving them of nutrition.

Let us now consider the relation of the bacteria to inflammation. All know that by a blow of an aseptic instrument we may destroy the life of a circumscribed portion of tissue. Immediately around it is set up a reparative inflammation. We may in like manner set up an inflammatory action, either with an aseptic acid or by pushing a small piece of metal or glass into the tissues, after first making them both aseptic. Such inflammations are purely reparative, they neither produce pus nor evince any disposition to spread. You all know what a surprising amount of injury one may inflict upon the mouth, and how kindly and promptly all its effects disappear, the repair being complete. Infect this mouth and how different the picture! In the old days when pus was thought to be a necessary accompaniment to healing, when instead of healing kindly the inflammation extended, we would say it was spreading by continuity of tissue. Now, with our greater knowledge of bacteria, we say the wound has become infected, and for every extension we say there is a new accession of germs.

Another factor worthy of the greatest consideration in the prognosis of inflammation is the power of resistance on the part of the patient; in other words, the ability of the tissue to manufacture antitoxin. It is this unknown quantity, together with the dose and virulence of the infecting germs, that makes the difference in cases apparently alike; this it is that explains why the case of alveolar abscess of A. healed so kindly, while that of B. continued indefinitely, locking the jaw and causing its thickening. This circumstance, this possibility should be kept in mind, and should teach us all to remember mercy, and not only mercy but charity and justice, when speaking of our colleagues. If the initial dose is large and virulent, the infecting germs possess great activity in the production of pus and toxins. Now should the vitality of the patient be low, his ability to throw out the germs or to produce antitoxins to neutralize their toxins small, the chances for a serious, protracted, and destructive inflammation are good, no matter who has charge of the case. I would not, however, be understood as minimizing good management and clean handling.

I will now say a few words on the mouth diseases caused by germs, but as I have already consumed much of your valuable time I shall merely enumerate them. Actinomyces are always found in the neighborhood of carious teeth, and probably exert more or less influence in their causation of the disease. Thrush is caused by the *oidium albicans*, and should not be confounded with aphthous sore mouth, which is simply a follicular stomatitis and not so serious a disease. Noma or cancrum oris is caused by the pus cocci, as staphylo- and streptococci, in overwhelming numbers. All inflammatory processes in the mouth may involve the mucous membrane, the muscular and fibrous tissues, or the bone and its periosteum, since all these tissues have a common blood supply. They may be involved singly or altogether, and we should in their treatment remember the good surgical rule, that acute inflammations need rest and sedation, and chronic inflammations stimulation.

In conclusion, I will say a few words on the most common and troublesome disease of the mouth we are called upon to treat, one that may properly be called the *bête noire* of dentistry. I refer to the alveolar abscess. It may be due to traumatism or to infection from spongy gums, but is far more frequently due to a diseased tooth. The inflammation usually begins in the pericemental mem-

brane about the diseased root. At the same time the pulp at its point of entrance into the root undergoes a more or less destructive inflammation. The alveolar periosteum or endosteum is involved, and the soft bone of the alveolus is more or less destroyed by softening. All the soft tissues in the apical space become infiltrated and thickened, and so the tooth is forced more or less out of its socket and seems elongated. The pain is excruciating; pressure upon the point of the tooth is painful, the tooth being sensitive to pressure or to slight tapping. When the pus begins to form there is a chilly feeling or a distinct chill, and the gums become edematous, swollen, and there is elevation of temperature. If the pus finds a means of discharge, the symptoms are ameliorated and perhaps there will be no further trouble. In other cases the relief is only temporary, a point of the apex remains infected, and after an interval the symptoms are renewed. If no outlet is easily found, the general periosteum becomes inflamed, and the whole jaw or a section of it is involved. There is then caries of the jaw-bone, or a thickening of it caused by the proliferative periostitis. If the inflammation is at the root of one of the posterior molars interference with the motion of the jaw may occur. This interference is due either to proliferation, thickening, and inflammation of the bone and tissues of the jaw or to involvement of the masseter and pterygoid muscles. Very rarely the pus burrows under the tissues of the jaw and opens on the lips or cheek or under the roof of the mouth and soft palate.

Treatment.—Sometimes, as before stated, the pus finds a vent either directly through the alveolar wall and gum or through the diseased root. This is nature's usual and favorable way of effecting a cure, and this is the method we should seek to imitate in all our efforts. How are we to know how long it is safe for us to await the unaided efforts of nature? In my opinion we are culpable if after the existence of any elevation of temperature for two consecutive days we postpone interference. Furthermore, if the patient is chilly or has a distinct chill, we may be sure pus has already formed. The same may be predicated if the tissues surrounding the jaws are edematous. We should under all such conditions immediately anesthetize the patient, make a free incision through the gum and periosteum, and with engine and drill make an opening at the junction of the alveolus with the body of the jaw to the apical

space, wash out thoroughly with hydrogen peroxid, and pack with gauze, to keep the opening free. Repeat the cleaning and packing daily until all symptoms disappear. In a few days the cure is complete.

I am aware that this manner of opening into the alveolar apex was advocated and taught many years ago, and Dr. Hermiston advocated it in the *Brief* of December last, but only when opening through the root was found impossible. I am also aware that there are those who advocate opening through the tooth or extracting it. While this is much better than poultices and inaction, it is far inferior to the opening that has been above advocated. The great advantages in an opening at the junction of the alveolus, and thus directly into the apical space, are, first, it is less painful and more quickly done; second, the opening being on the lowest level of the abscess, it is most advantageous for draining. Above and beyond all these is the fact that if drainage is sought by drilling through the root and pulp the pus must work itself out against the force of gravitation. Furthermore, in drilling through the apex of the root the latter is liable to be comminuted, and small pieces become imbedded in the apical space and its surrounding periosteum and act as a nidus for prolonging the inflammation. Failing in this it may remain as an infected focus or as a foreign body, and at any time light up a new inflammatory process in the effort of nature to get rid of it. If the tooth is extracted difficulty may be experienced from the fact that often in such cases, while destruction is going on in the soft alveolar process, there is a proliferative apical pericementitis, the two going on *pari passu*, the one destroying, the other building up an exosteal tumor on the root. This tumor, to say nothing of the general and local sensitiveness, makes extraction neither a light nor safe task, and moreover the root may be easily broken off, when the last condition of that patient will be worse than the first. Another element of danger in extraction is that a piece of the alveolus may be driven into the gum, and set up a purulent periostitis or an inflammation of the gums or of the tissues covering the jaw. These inflammations may be both annoying and protracted.

As serving to illustrate as well as to emphasize this point, and to show the general perversity of the conditions involved, I will briefly report the following case: Miss N. M., aged twenty, a domestic,

was attacked with alveolar abscess. She called successively upon two of our dentists, who refused to extract her tooth, a practice I cannot too strongly condemn. A third, and one of our most conscientious and able dentists, acceded to her request and extracted the tooth. Notwithstanding this the urgent symptoms did not subside, and he treated her for a considerable time without any special improvement. Suppuration took place and made two different openings under the lower border of the jaw. She then called on me, and though antiseptic, sedative, and antiphlogistic treatment, as well as local stimulation, was tried, there seemed to be little improvement during the ten or twelve days she remained under my treatment. The sinuses were probed and no denuded or carious bone could be felt. The whole side of the face, including the parotid region, was swollen and infiltrated, and the mouth could not be opened more than half an inch. Dr. E. B. Adams saw the case with me, and strongly advised an operation, he being satisfied that there was carious bone. Though I did not feel at all convinced that there was, yet considering the dense hardness of the swelling, the long time it had existed without showing any positive improvement, and the danger of the swelling being due to proliferative periostitis, I did not feel like taking the responsibility of longer inaction, and so sent her to the Mercy Hospital. Dr. Brown being on duty, at my suggestion made an opening down to the edge of the jaw-bone from a point about midway between the symphysis to the angle, and about half-way up the ascending ramus. The incision was kept well under the edge so the resulting scar would be pretty well shaded. The bone was stripped of its periosteum up to and well on to the alveolar process, when to our surprise no sign of caries was to be found. There was found a piece of the alveolus about half the size of the nail of the little finger. This was removed and the periosteum replaced and the wound sewed up. It healed kindly, without any temperature, and there has to this day been no recurrence of the trouble. Even at this time she cannot open her mouth to its wonted extent. Some of her friends from out of town felt there must have been something wrong in the dentist's treatment, although I assured them that he had treated her skilfully and conscientiously.—*Brief.*

The Dental Digest.

PUBLISHED THE FIFTEENTH DAY OF EVERY MONTH

At 2231 Prairie Avenue, Chicago,

Where All Communications Should be Addressed.

Editorial.

PROFESSIONAL AND CIVIL DUTIES.

We would call the attention of our readers to the president's annual address read before the last meeting of the Illinois State Dental Society by Dr. A. H. Peck, and published on page 808 of this month's issue of the DIGEST. It is essentially different from most addresses of the kind, in that it does not deal with hackneyed technical topics, but with broad principles which apply to dentists as citizens as well as professional men. The essayist urges that the professional man is under peculiar obligations to the commonwealth because of his higher mental training and more exalted position in the community. From purely selfish reason dentists should take up some sort of work aside from their profession, for the calling of dentistry is necessarily narrowing, and if a man devotes himself to it alone for a few years he gets into a rut from which it is almost impossible to escape. There are about thirty thousand dentists in practice to-day in the United States, but except in a professional way they are unknown to the country at large. Like Dr. Peck, we do not urge that dentists or other professional men shall become political office-seekers, but we do urge that they recognize more fully than they now do their obligations to themselves, to their profession, to their community and to their government. Before taking up outside work, however, we should perfect our professional organizations. It is a disgrace to the name of dentistry that not more than ten per cent of the dentists in a state belong to the state society, and until the profession can get out of the rut and shake off the lethargy in this regard we do not see much hope for or use in advocating bigger and broader things. Dentistry is a comparatively young profession, but has come into great prominence during the last few years because of the tremendous mechanical strides it has made. The time has come, however, when dentists must be something more than mechanics, and if it is to be known

as a learned profession, and we are to be recognized as scientific and broad-minded men, more interest must be taken in society work, dental literature, and other matters that are not confined to the individual office and laboratory.

PROPER AND ETHICAL LANGUAGE FOR DENTISTS.

On Page 877 of this month's issue of the *DIGEST* we publish a timely article on this subject. Dr. Gowan is correct when he states that not only the individual dentist but the profession of dentistry is judged by the language used. Some of the words to which he refers are of course not used by any but the most illiterate, but there are few dentists who are not guilty of using some of the objectionable terms outlined. The public readily distinguishes between the ethical, competent physician and the medical charlatan or advertising quack, but we are sorry to say that it does not recognize so strong a distinction between the ethical dentist and the fakir. This is of course due in part to the fact that dentistry is a young profession, and the public is not yet educated to the point of considering its teeth of any special value, but part of the blame must fall upon the profession for using trade instead of professional terms. There can be no objection to any of the essayist's criticisms or suggestions, and if they are heeded the profession of dentistry and the value of its service cannot help but be enhanced in the eyes of the community.

LITERATURE IN DENTAL OFFICES.

Without fear of successful contradiction we make the statement that not one dentist in fifty even makes a pretense of keeping current literature on the table in his reception room. Most dentists apparently consider their full duty discharged if they have a few tattered and torn magazines of ancient vintage displayed for the edification of their patients. A visit to the dental office is not a cheerful prospect for the average individual, and some have suggested that the reason why dentists keep such unattractive reading matter on their tables is because after a few moments' perusal of it the patient is glad to escape anywhere from it—even into the operating chair. Seriously speaking, however, dentists would find that the outlay of say one dollar per month for the standard current magazines would repay them several times over. The aver-

age patient, man or woman, dreads the work which is to be done, and the longer he or she must wait in the reception room the greater the dread and uneasiness. A few moments' perusal of the standard popular literature of the day would take their minds off themselves and the coming operation, and they would come into the office in a more cheerful frame of mind, and consequently in much better condition for the operator. Anything that can divert the mind into pleasant channels while waiting for the dentist is a positive godsend, and your patients will appreciate a little attention along this line. Another very good reason for keeping late standard literature on the reception room table is that patients, especially new ones, are apt to judge by externals, and you cannot blame them for thinking that if a man is two or three years behind in literature he would also be in his work. You would not ask your patients to sit in uncomfortable, broken-down chairs, so why ask them to be content with aged, dilapidated and unattractive reading matter?

Notices.

FIRST DISTRICT DENTAL SOCIETY OF ILLINOIS.

The First District Dental Society of Illinois will hold its twenty-first annual meeting at Macomb, Sept. 15-16, 1903.

H. W. McMILLAN, Secy., Roseville.

NORTHERN INDIANA DENTAL ASSOCIATION.

The Northern Indiana Dental Association will hold its annual meeting at Wabash, Sept. 15-16, 1903. The profession is cordially invited to be present.

J. A. STOECKLEY, Secy., South Bend.

NEW JERSEY STATE DENTAL SOCIETY.

The New Jersey State Dental Society held its annual meeting at Asbury Park, July 14-17, 1903, and the following officers were elected: Pres., H. S. Sutphen; V-P., W. G. Chase; Secy., C. A. Meeker; Treas., H. A. Hull.

RHODE ISLAND DENTAL SOCIETY.

The twenty-sixth annual meeting of the Rhode Island Dental Society was held July 14, 1903, and the following officers were elected: Pres., J. A. Lynch; V-P., P. B. Whitmarsh; Secy., C. A. Carr; Treas., H. W. Gillette; Librarian, D. F. Keefe; Ex. Com., J. E. Powers, L. A. Wilbur, John Stearns.

NORTH CAROLINA DENTAL SOCIETY.

The North Carolina Dental Society held its annual meeting at Winston-Salem, June 18-20, 1903, and elected the following officers: Pres., J. M. Fleming; 1st V-P., J. A. Gorman; 2d V-P., J. B. Little; Secy., J. S. Betts; Treas., R. M. Morrow; Essayist, P. E. Horton. The next meeting will be held at Morehead City, June, 1904.

MICHIGAN STATE DENTAL ASSOCIATION.

The Michigan State Dental Association held its annual meeting at Petoskey July 7-9, 1903, and the following officers were elected: Pres., C. C. Noble; V-P., F. H. Essig; Secy., J. J. Green; Treas., J. Ward House; Mem. Board of Trustees, H. K. Lathrop, Jr.

The papers will be published in the DENTAL DIGEST.

NORTHERN IOWA DENTAL SOCIETY.

The ninth annual meeting of the Northern Iowa Dental Society will be held at Clear Lake, Sept. 1-3, 1903. The Society will make a special feature this year of the school of porcelain art under the supervision of Dr. J. H. Prothero of Chicago. The several other strong numbers on the program will make this meeting one long to be remembered.

C. L. TOPLIFF, Secy., Decorah.

MARYLAND STATE DENTAL ASSOCIATION.

The twenty-first annual meeting of the Maryland State Dental Association was held June 24, 1903, at Baltimore, and the following officers were elected: Pres., W. G. Foster; 1st V-P., A. C. Brewer; 2d V-P., H. E. Kelsey; Cor. Secy., F. F. Drew; Rec. Secy., W. W. Dunbracco; Treas., S. C. Pennington; Members of Board of Governors, Geo. R. Carter, C. M. Gingrich, B. Holly Smith.

PENNSYLVANIA STATE DENTAL SOCIETY.

The Pennsylvania State Dental Society held its annual meeting at Wilkes-barre, July 7-10, 1903, and elected the following officers: Pres., G. L. S. Jameson, Philadelphia; 1st V-P., I. N. Broomell, Philadelphia; 2d V-P., C. V. Kratzer, Reading; Rec. Secy., G. W. Cupit, Philadelphia; Cor. Secy., V. S. Jones, Bethlehem; Treas., R. H. D. Swing, Philadelphia; Ex. Council, I. N. Broomell, Philadelphia, H. S. Seip, Allentown, H. M. Beck, Wilkesbarre.

The papers and proceedings will be published in the DENTAL DIGEST.

News Summary.

S. W. BAKER, a young dentist at Roanoke, Va., died July 5, 1903.

W. C. HUNT, 31 years old, a dentist at Spokane, Wash., died July 14, 1903.

H. McLELLAN, 26 years old, a dentist at Ottawa, Can., died July 15, 1903.

H. J. BROWN, a dentist at Norristown, Pa., was declared insane June 27, 1903.

J. E. LIBBEY, 61 years old, a well-known dentist of Pittsburg, died July 18, 1903.

D. B. LEE, 86 years old, a retired dentist of Santa Barbara, Cal., died July 10, 1903.

G. M. MERRICK, 26 years old, a dentist at Detroit, died June 26, 1903, from peritonitis.

C. W. HODGDON, 75 years old, a retired dentist at Kensington, N. H., died July 4, 1903.

R. E. DAVIS, 26 years old, a dentist at Cleveland, died July 10, 1903, from typhoid fever.

R. R. HOGUE, 33 years old, a dentist at Washington, Ga., died June 20, 1903, from heart failure.

G. B. SHEPARD, 43 years old, a dentist at Ripon, Wis., died June 29, 1903, from heart failure.

F. G. McELHANEY, a retired dentist at Auburn, Ala., died June 28, 1903, after a long illness.

DIVORCE.—Felton Landon, a dentist of Chicago, was sued for divorce by his wife on July 15, 1903.

C. E. STRONG, 44 years old, a dentist at New Haven, Conn., died June 27, 1903, after a long illness.

W. L. DOYLE, a dentist at Wichita, Kan., committed suicide recently after having killed a man in a quarrel.

TO PROTECT STEEL FROM RUST.—Resin melted with 6 or 8 parts lard will protect for years.—*Exchange*.

F. H. BULL, for twenty-three years in the practice of dentistry at Winfield, Kan., died June 16, 1903, from paralysis.

C. J. SOWLE, a dentist of Rockford, has been appointed dental surgeon of the Third Brigade, Illinois National Guard.

BANKRUPT.—Charles H. Land, a well-known dentist of Detroit, filed a voluntary petition in bankruptcy June 18, 1903.

J. O. NESS, a dentist at Sioux City, Ia., died July 16, 1903, as the result of severe burns received by the explosion of a gasoline tank in his laboratory.

J. D. NEFF, a dentist at Coffeyville, Kan., died July 5, 1903, from blood poisoning resulting from injuries received by the bursting of his vulcanizer.

TO KEEP STEEL PENS FROM RUSTING.—Saturate a sponge with a solution of potassium carbonate and let the pen rest on the sponge when not in use.—*Cosmos*.

ELGIN (ONTARIO) DENTAL SOCIETY elected the following officers June 17: Pres., H. Way; Vice-president, F. E. Bennett; Secy. and Treas., E. W. Honsinger.

POTASSIUM PERMANGANATE SOLUTION FOR TOOTHACHE.—A one-twentieth

solution of potassium permanganate is powerfully effective in toothache.—*Med. Summary.*

R. A. WASSON, a prominent dentist of Kansas, and for twenty years in practice at Ottawa, is in a serious condition resulting from a complication of Bright's disease and heart disease.

NEW BRUNSWICK DENTAL SOCIETY held its annual meeting July 14, 1903, and elected the following officers: Pres., H. W. Murray; Vice-pres., James Manning; Secy. and Treas., F. A. Godsoe.

D. M. CATTELL, for many years in the practice of dentistry at Chicago, and prominent in college work, has become a member of the faculty of the dental department of Vanderbilt University at Nashville.

ACCIDENTS.—July 3, 1903, a dentist at Cameron, Tex., was badly hurt by the explosion of his vulcanizer.—The building in which Dr. Wm. McInerney had his office at Abilene, Kan., collapsed during the recent floods.

A "CANDLE POWER."—A candle power is considered to be the light produced by a standard candle, six to the pound, burning 120 grams spermaceti wax per hour; candle $8\frac{3}{4}$ inches long, 0.85 inch diameter.—*Exchange.*

MENTHOL.—An ethereal solution of menthol, ten to fifty per cent, applied by a camel's hair brush, averts boils, carbuncles and inflammatory gatherings and cures itching eruptions.—*Med. Summary.*

FIRES.—F. J. Carrier, New York City, June 27; loss \$300.—J. T. Little, Merkel, Tex., June 23; loss \$300, fully insured.—F. M. Lynde, Barre, Vt., June 17; loss \$100, fully insured.—L. E. Blair, Beaver Dam, Wis., June 21; loss \$200.

WATERVILLE (ME.) DENTAL SOCIETY was organized June 24, 1903, and the following officers were elected: Pres., E. H. Kidder; Vice-pres., M. D. Johnson; Secy. and Treas., G. A. Smith; Ex. Com., G. W. Hutchins, E. L. Jones, H. J. Toward.

NEGRO DENTAL ASSOCIATION held its annual meeting at Washington, D. C., July 2-4, 1903, and elected the following officers: Pres., A. J. Gwathney; 1st Vice-pres., R. G. Baker; 2d Vice-pres., A. R. Taylor; Secy., C. C. Fry; Treas., A. M. Waring.

SALT LAKE CITY (UTAH) DENTAL SOCIETY was organized July 15, 1903, and the following officers were elected: Pres., A. S. Chapman; 1st Vice-pres., A. B. Dunford; 2d Vice-pres., P. J. Wherry; Secy. and Librarian, L. E. Arnold; Treas., E. A. Tripp.

DOUBTFUL.—An exchange reports that a man in South Dakota was operated upon for appendicitis, when it was found that he had been swallowing whole grains of wheat, which had sprouted in the bowels, and the Hessian fly was at work on the wheat.

FINISHING RUBBER PLATES.—(Dr. F. A. Weld, Belvidere, Ill., in *Review*.)—A very glossy surface can be given vulcanite work by using a dry and moderately stiff brush-wheel charged with talcum powder after having finished with pumice or emery.

TEXARKANA DENTAL SOCIETY was organized July 10, 1903, and the fol-

lowing officers were elected: Pres., P. A. Skeen; Vice-president, T. A. Sims; Secy. and Treas., A. E. Chambers. The membership is composed of dentists of Arkansas and Texas.

CLEAN ALL FRUIT.—Twelve million bacteria inhabit the skins of half a pound of cherries, according to a noted German scientist. Currants come next with 11,000,000 to every half pound, and grapes next with 8,000,000. All fruit should be cleaned, either by peeling or washing, before it is eaten.—*Alk. Clinic.*

ANNEALING.—The late Sir W. C. Roberts-Austen defined annealing "as the release of strain in metals which may itself have been produced by mechanical treatment, such as hammering, rolling or wire-drawing, or by either rapid or slow cooling from a more or less elevated temperature."—*Pop. Mechs.*

HARVARD DENTAL ALUMNI ASSOCIATION held its thirty-second annual meeting at Boston, June 22, 1903, and elected the following officers: Pres., C. E. Perkins; Vice-pres., A. H. Stoddard; Secy., Waldo E. Boardman; Treas., E. P. Holmes; Ex. Com., Waldo E. Boardman, Wm. P. Cooke, H. S. Parsons.

THREE IMPORTANT DON'TS.—Don't operate on your cases of tic douloureux before pushing strychnin and aconitin to their full physiological limit. Don't incise a gumma; promote absorption with potassium iodid. Don't permit a man to administer chloroform who is accustomed to give ether.—*Medical World.*

BEWARE OF VIDDERS.—A man visiting Liverpool was being shown about by a citizen who said, "Now let's go and see the Widows' Home."

"No, thanks," replied the man, "I saw a widow home once, and she sued me for a breach of promise; it cost me a matter of \$120. No, sir! Send the widows home in a cab."

ALAMEDA COUNTY DENTAL SOCIETY has succeeded the Oakland (Cal.) Dental Club, the change of name being made on May 3, 1903. The following officers are now serving: Pres., J. L. Pease; Vice-pres., W. F. Schwaner; Secy., J. C. Gilbertson; Treas., W. F. Lewis. Meetings are held the first Wednesday in each month, and the society is prospering.

CANDY FOR CHILDREN.—Dr. Fothergill of London believes that candy, given to children after meals in reasonable quantity, is of decided benefit, since children need sugar for maintaining animal heat and for easily-digesting nourishment. He advises molasses taffy for the prevention of phthisis in children of consumptive tendency.—*Phila. Med. Jour.*

NOSE-BLEED.—The best remedy for bleeding at the nose is the vigorous motion of the jaws, as if in the act of chewing. In the case of a child, a wad of paper should be inserted and chewed hard. It is the motion of the jaws that stops the flow of blood. The remedy is very simple, but has never been known to fail in a single instance, even in the severest cases.—*Medical Brief.*

VICTORY FOR DENTIST.—A dentist in Rochester, N. Y., recently sued a man for \$527.50 for services rendered in straightening his child's teeth. The dentist produced his books in court, showing the number of hours, etc., and brought casts showing the condition of the child's teeth at various times. After a

short deliberation the jury gave him judgment for the full amount of his claim.

CALIFORNIA DENTAL LAW UNCONSTITUTIONAL.—A judge in the Superior Court of California has rendered a decision that the dental law is unconstitutional. The decision states that the law is class legislation, in that it requires all persons who enter upon the practice of dentistry after the passage of the law to obtain a license, while those who were engaged in practice prior to such date are exempt from the provisions.

DENTISTRY IN ALASKA.—

The wild wind blew o'er the Klondike vale,

Biting and blustering, fierce and cold.

The dentist smiled as he viewed the gale—

"The teeth of the storm have been filled with gold."

—Judge.

DEFLECTION OF THE NASAL SEPTUM.—Dr. Nelson M. Black of Milwaukee calls attention particularly to some cases due primarily to a high-arched palate, the result of the deformity of the upper jaw, and the satisfactory results obtained by having the lateral diameter of the jaw widened so as to relieve the strain of the septum before performing any intranasal operation for its correction.

DRAINAGE OF CAVITIES CONTAINING THICK PUS.—Cavities containing thick pus should not, as a rule, be drained with gauze, for the reason that the pus is too thick to be amenable to the laws of capillarity, and because the gauze may also have a tendency to block and practically cork up the wound. Tubes, rolls of protective tissue, silkworm-gut, and horsehair are to be preferred.—*Internat. Journ. of Surgery.*

WOMAN SWINDLER.—It is reported that an old but clever swindle is again being successfully worked in eastern cities. A well-dressed woman enters the dentist's office and asks for an examination, at the conclusion of which she makes an appointment and prepares to leave, but suddenly discovers that she has lost her pocketbook. She borrows a dollar or two from the dentist, and that is the last he ever sees of her.

SORENESS OF GUM FROM THE APPLICATION OF CLAMPS TO TEETH.—The soreness which follows the application of an ill-fitting clamp can be prevented in a great majority of cases by brushing the gum around the neck of the tooth with tincture of calendula. This preparation has the valuable property of preventing soreness and suppuration and of inducing the rapid development of healthy granulations.—J. E., in *Cosmos*.

ROBBERIES.—July 14, burglars broke into the offices of two dentists at Princeton, Ind., and stole about \$200 worth of gold.—July 13, the office of a dentist at Hopkinsville, Ky., was robbed of \$100 worth of gold.—July 13, the offices of five dentists at Henderson, Ky., lost altogether about \$200 through burglary.—July 9, the office of a dentist at Jackson, Mich., was robbed of \$50 worth of material.—June 21, a thief entered a dentist's office at Pontiac, Mich., but made only a small haul.—June 25, the office of a dentist at St. Louis was robbed of gold and material.—June 21, a dentist at Marion, O.,

lost \$50 through thieves.—June 15, a dental office at Cincinnati was robbed of about \$60 worth of material.—June 25, the offices of two dentists at Piqua, O., were robbed of about \$100 worth of stuff.

BURGLAR HIDES IN DENTAL CHAIR.—Last month a burglar who was being pursued by two detectives ran into the office of a Chicago dentist and at once seated himself in the operating chair, telling the dentist that his tooth was aching violently. The unsuspecting operator was working on the fellow when the detectives entered the office.

DANGERS IN GELATIN INJECTIONS.—According to Drs. A. Stengel and D. L. Edsall (*American Medicine*), the injection of gelatin for the purpose of arresting internal hemorrhage is at times followed by the formation of emboli in the smaller vessels; these, becoming infected, not infrequently break down and form abscesses. Injury to the kidneys may result from the injection of the gelatin; pulmonary edema may be induced and is not uncommon in animal experimentation. Pain usually accompanies these injections.

EFFECTUAL REMEDY.—A sad-looking man went into a drug store and asked the druggist if he could give him something to drive from his mind thoughts of sorrow and bitter recollection. The druggist nodded, and put up a mixture of quinin and wormwood and rhubarb and epsom salts, with a dash of castor oil, and gave it to the man; and for six months he could not think of anything except new schemes for getting the taste out of his mouth.—*New Idea*.

CHLOROFORM VOMITING.—According to the *Medical World*, Fraenkel uses the combination which here follows to prevent chloroform vomiting:

R—Morphinæ muriatis, 20 grains;
Atropinæ sulfatis, 2 grains;
Chloral hydratis, 35 grains;
Aquæ destillatæ, 2,100 grains. M.

Sig.—Hypodermic injection of 15 to 20 drops before beginning anesthesia.

ROUGHENED BASE ON PORCELAIN INLAYS.—(Dr. J. S. Bridges, Chicago, in *Review*.)—Place an extremely thin layer of very coarse, high-fusing body over the floor and nearly to the margins of the matrix. This spread must be of much higher-fusing porcelain than contained in the body of the inlay. Bake to a *slight bisque*. If the other porcelains are handled correctly the result will be a nicely granulated surface on the base, which is especially applicable to small and shallow cervical restorations, where the staying qualities are difficult to obtain.

SOLDER FOR ALUMINUM.—A great drawback to the use of aluminum for many purposes is the difficulty of soldering it. A number of solders are known that are fairly successful when manipulated by skillful hands. The following one, given in a recent issue of the *Aluminum World*, is presumably of the same class, and is given for what it is worth. It was recommended by Prof. E. Wilson, in a paper read before the Society of Arts. The constituents are 28 pounds block-tin, 3.5 pounds phosphor-tin. The phosphor-tin should contain ten per cent of phosphorus. The following instructions should be followed when soldering aluminum: Clean off all dirt and grease from

the surface of the metal with benzine, apply the solder with a copper bit, and when the molten solder covers the surface of the metal, scratch through the solder with a wire brush, by which means the oxid is broken and taken up. Quick manipulation is necessary.—*Power and Transmission.*

RANGE OF VISION.—How far a man can see with unaided vision depends upon several conditions—the clearness of vision in the individual, the density of the atmosphere, the size of the object and the illumination. Under proper conditions an object 1 foot above a level stretch can be distinguished 1 1-3 miles; one 10 feet high, 4 1-6 miles; 100 feet high, 13 miles; mountains 5,000 feet high can be seen 95 to 100 miles. Five miles may be taken as the limit at which a man can be seen by an observer on the same level.—*Power and Transmission.*

DIVERS.—A colored clergyman in Tennessee recently preached a sermon on the text, "And the multitude came to Him, and He healed them of divers diseases." Said he: "My dying congregation, this is a terrible text. Disease is in the world. The smallpox slays its hundreds, the cholera its thousands, and the yellow fever its tens of thousands, but, in the language of the text, if you take the divers you are gone. These earthly doctors can cure smallpox, cholera and yellow fever, if they get there in time, but nobody but the good Lord can cure the divers."

REMOVAL OF SWALLOWED BODIES.—Whenever a foreign body has been swallowed it may be removed by an emetic or by gastrotomy, or it may be allowed to pass through the intestinal canal. If the body is of such size and form that it may be vomited, it is always safest to cause the patient to eat some pulaceous food, like oatmeal, before causing him to vomit. If the body, though small enough to pass readily through the esophagus, is sharp, such as a pin or other small sharp article, give plenty of bulky food and trust that it may be passed.—*International Journal of Surgery.*

PULLING A TOOTH.—An Irishman who had gone into a dentist's to get a tooth pulled had it out in a few seconds.

"That will be half a crown," said the dentist.

"Half a crown!" said Pat. "Why, the last tooth I got pulled at home the old doctor set me down on the floor, and put the nippers in my mouth and pulled me round and round the room, out of the door and down the stairs. When we got to the foot, the doctor said, 'By the help of heaven and the attraction of gravity we'll hev her out yet,' so when we got to the top out came the tooth, and he only took a shillin'!"—*London Tid-Bits.*

MARRIED.—L. B. Duncan, Salt Lake City, Utah; Annie English, Elizabethtown, Ky., July 1.—H. J. Graham, Oroville, Cal.; Iola Harris, San Jose, Cal., June 28.—O. J. Graham, Denver, Col.; Emma Campbell, Milwaukee, Wis., July 8.—E. D. House, Argentine, Kan.; Anna R. Ashworth, Barnard, Mo., June 24.—R. W. Hellwarth, Dodge City, Kan.; Nannie Dunn, Dodge City, June 25.—Carl Jones, Cairo, Ill.; Ora Faulkner, Wyckliffe, Ky., June 19.—G. P. Kier, El Dorado, Ia.; Lydia R. Wachtel, New Hampton, Ia., June 24.—H. J. Lockhart, Ely, Minn.; Laura Wilklow, Stillwater, Minn., July 15.—C. R. McDermott, Worcester, Mass.; Della E. Lawton, Boston, June 24.—Lee O'Grady,

Lancaster, O.; Anna Starkey, Lancaster, June 24.—Wm. Shepard, Alameda, Cal.; Della Grimmer, Oakland, Cal., June 25.—W. A. Suthers, Shellsburg, Ia.; Emma Templeman, Iowa City, Ia., July 14.—Sydney Smith, Paducah, Ky.; Zilther Kellings, Prospect, Tenn., July 7.—Bert Stevens, Lexington, Ill.; Rheba Mahan, Lexington, June 17.—Carra Ulman, New York City; George Alexander, New York City, July 3.—E. W. Walker, Rolla, Mo.; Estelle Duckworth, Rolla, June 26.—M. J. Winn, Columbus, O.; Cordelia Bowles, Columbus, June 30.

A CONTRAST.—An American graduate in dentistry, formerly practicing in Philadelphia, was the assistant of one of the leading dentists of Vienna up to a few days ago, when the authorities fined him and expelled him from the country for having pulled a tooth. The Austrian law permits a foreigner to act as an assistant to a dentist, but not to perform any operation. At the same time that this occurred an Austrian surgeon was operating freely in America, and when someone suggested that he was breaking the law the medical examiners courteously gave him a private examination and presented him with a certificate of qualification.—*Exchange*.

CARBOLIC ACID IN ARSENICAL PASTES.—In devitalizing pulps with arsenic difficulty is often experienced, the arsenic seeming to have no effect. I do not think it is a good plan to mix carbolic acid into an application, for it coagulates the pulp-tissue and produces an eschar which, while perhaps not sufficient to prevent the action of the arsenic, would certainly retard it.—F. E. Crosby, *Dental Summary*. [We have devitalized a number of teeth with a formula recommended by Dr. James Truman, composed of arsenious oxid, iodoform and carbolic acid, and have never observed anything that would warrant the exclusion of carbolic acid.—Ed. *Cosmos*.]

ILLEGAL PRACTITIONERS.—July 9, a dentist at La Junta, Colo., was arrested and fined \$100 for practicing dentistry without a license. The fine was suspended on his promising to leave town at once.—We stated last month that the license of a dentist at Omaha had been revoked because of unprofessional conduct. He appealed the case, and the State Board of Health has upheld the action of the Dental Board in revoking the license.—A dentist in New Jersey was arrested some time ago for practicing dentistry without a license. The judge in the lower court found him guilty, as did the Supreme Court, and the case has now been taken to the Court of Errors and Appeals. The man's lawyers contend that because he practised in the state before the dental law was passed it is not necessary for him now to take out a license.—Characterizing their methods as a "great swindle," a judge in Philadelphia, on July 2, sentenced George C. Courtwright, president of the Alba Dental Co., and Wm. Powell, its manager, to one year and three months' imprisonment, respectively, upon their conviction of conspiracy to defraud. Courtwright was not a graduate of any dental college, and it was proven that students were employed and that untruthful advertising was done. A few such lessons as this would drive the fakirs out of business.

DAMAGE SUITS.—A woman in New York recently sued a dentist for \$2,000 damages, claiming that because of his improper treatment of a tooth a scar

was left on her face. The dentist proved that an abscess had pointed on the outside of her face before she came to him, and the jury returned a verdict in his favor.—A dentist in New York City has been sued for \$25,000 damages by a man who alleges that, owing to the dentist's carelessness in extracting a tooth from the mouth of his son, blood-poisoning set in and caused his death.—A man in Memphis, Tenn., has sued a dental parlor in that city for \$5,000 damages, alleging that the operator extracted a sound tooth by mistake.

CELLULOID—GERMAN SUBSTITUTE FOR.—The extensive commercial use of celluloid has caused a great many people to try to find substitutes for or imitations of it. In Coburg a popular imitation has been made by dissolving in 16 parts—by weight—of glacial acetic acid 1.8 parts of nitro-cellulose, and adding 5 parts of gelatin. Gentle heating and stirring are necessary. After the mass has swollen it is mixed with 7.5 parts of alcohol (96 per cent), and stirring is continued. The resulting product is poured into moulds, or after further dilution may be spread in thin layers on glass. As an underlay for sensitive photographic films the material has important advantages, not the least being that it remains flat in developing.—*Scientific American*.

SUCTION CHAMBERS.—I have not used a suction chamber at all this winter, and in a case which seemed most unpromising I surprised myself by obtaining the best result. The mouth had been utterly ruined (as I thought) by a rubber plate with a deep suction chamber. The roof was flat and flabby with a horrible excrescence due to a deep chamber with sharp edges, and all of the ridge in the incisal region on one-half of the maxilla had been lost by absorption. I used a broad relief equal in thickness to No. 60 tin foil, and obtained a gold plate which rested immovably during all the excursions of the lower jaw, notwithstanding the need of unusual prominence in the incisal region. We live and learn; at least we may if willing to heed advice.—R. Ottolengui, *Dental Review*.

MALFORMATION OF THE TEETH AND MAXILLÆ IN HEREDITARY SYPHILIS.—A. Brunet (*Gazette des Hopitaux*).—The many works and observations of Magitot and Prof. Fournier have thrown some definite light upon this subject. Contrary to the theory of Parrot, syphilis is not the only cause of these malformations; in fact, the malformations or erosions of the teeth are the common lesions which may be produced by the simple affections of nutrition, or any condition which may perturb nutrition or development. Madame Sollier in her inaugural thesis, based on one hundred observations, has observed that idiots and those of arrested development present the stigmata usually ascribed to the influence of hereditary syphilis. There are certain lesions of this character upon which the writer places more stress, as they occur most frequently in known heredo-syphilitics and infrequently in other affections. The erosion of the first molar, especially the interior, is of all the teeth the most frequently affected in hereditary syphilis; the reason for this being that it is the only tooth of the second dentition in which ossification commences *in utero*. In Hutchinson's teeth, the superior median incisors, ossification commences the first month after birth, therefore their erosion is to be considered one of the

best symptoms of presumptive hereditary syphilis. The arched palate and other deformities of the maxilla are symptoms merely of degeneracy and not of any value in the diagnosis of heredo-syphilis.

IMPRESSIONS OF LOOSE LOWER INCISORS.—(Dr. C. E. Woodbury, Council Bluffs, Iowa, in *Review*.)—Take enough plaster paris on the ends of the first and second fingers of the right hand to cover the lingual surfaces of the six or eight anterior teeth to a thickness of about three-quarters of an inch. Place it in position in the mouth and allow it to set thoroughly, making no effort to cover the labial surfaces of the teeth. If the teeth are moved out of place they can be readily seen and put back in their normal position before the plaster becomes hard. Remove this impression by pushing it backward, and trim if necessary. Coat the surface with a separating material and place it in position in the mouth. Cover the labial surfaces of the teeth with soft plaster, being careful to bring it well over the end of the plaster cast already in place. When thoroughly set this part of the impression can be removed labially, and when both pieces are removed from the mouth and placed together the result is a perfect impression, without danger of injury to the loose teeth. This is also a good way to take an impression where the lower incisors tip in at the incisal edge.

EXAMINING BOARD AFFAIRS.—At the June meeting of the California Board thirty-five out of forty-seven candidates passed the examination.—July 1, the Delaware Board passed six applicants for licenses, and elected the following officers: Pres., R. H. Jones; Secy., C. R. Jefferis; Treas., S. H. Johns.—July 1, the Indiana Board elected the following officers: Pres., W. M. Haas; Secy. and Treas., D. L. Stine.—June 20, the Iowa Board elected the following officers: Pres., F. M. Shriver; Secy., C. S. Searle.—At the June meeting of the Minnesota Board fifty-one out of seventy-one applicants passed the examination.—At the meeting of the New Jersey State Dental Society, July 14-17, 1903, the governor of the state was criticised for appointing one new member and reappointing one old member of the Board without consulting the State Society, as he is required to do by law.—At the July meeting of the North Carolina Board twenty-four out of thirty-two applicants passed the examination.—June 26, the governor of South Dakota appointed Dr. F. E. Field of Sioux Falls a member of the Board.—At the last meeting of the Virginia Board twenty-seven applicants passed the examination.

DENTIST'S TALK NOT CHEAP TALK.—

1 gold crown	\$10
20 minutes' conversation	5
1 filling	4
15 minutes' conversation	4

The foregoing is a reproduction of a bill rendered one of Baltimore's well-known young society girls some time ago by a prominent dentist, and, furthermore, it has been paid. Whether Miss ——— ever intends to speak to the dentist again is what Kipling would call "another story." This young lady had occasion to go to the dentist some time ago, and was much flattered

when, after the busy man had put a gold crown in place, he talked to her upon various topics of the day for 20 minutes. She was more flattered when the same thing happened after he had filled one of her teeth, but when the bill came, as above, she was of course justly outraged, and sought out the wicked man. He explained, to her intense disgust, that he had merely talked to her for the periods mentioned to quiet her nerves between the dental operations, and that, as he was a very busy man, his conversation was worth at the rate of \$15 an hour.—*Baltimore News*.

AN AWFUL FATE.

Full many a mortal, young and old,
Has gone to his sarcophagus,
Thro' pouring water, icy cold,
Adown his warm esophagus.

—*Doctor's Magazine*.

LIQUID HYDROGEN.—Professor Dewar gives a masterly account of liquid hydrogen which contains information new to most of us. Liquid hydrogen, he says, has a clearly defined surface, is easily seen, drops well, in spite of the fact that its surface tension is only the thirty-fifth part of that of water. It can easily be poured from vessel to vessel. It does not conduct electricity. Its specific heat is ten times that of liquid air and five times that of water. The coefficient of expansion is remarkable, being about ten times that of the gas. It is by far the lightest known liquid, its density being only one-fourteenth that of water. The only solid that will float upon it is the lightest pith. It is by far the coldest liquid known. At ordinary atmospheric pressures it boils at minus $252\frac{1}{2}^{\circ}$ C. The vapor rising from the liquid has a density nearly the same as that of air. By reducing the atmospheric pressure with an air-pump to minus 258° the liquid becomes a solid resembling frozen foam, and this solid can be further cooled to minus 260° , which is the lowest steady temperature yet attained. The solid hydrogen may be obtained also in the form of a clear, transparent ice with a density of one-eleventh that of water. Such cold involves the solidification of every gaseous substance, save one, known to the chemist, and in this way liquid hydrogen introduces the investigator to a new world of solid bodies. The contrast between liquid hydrogen and liquid air is most remarkable. The removal of the loose plug of cotton-wool used to cover the mouth of the vacuum vessel in which it is stored is followed by a miniature snowstorm of solid air, formed by the freezing of the atmosphere at the point where it comes into contact with the cold vapor rising from the hydrogen. This solid air falls back into the vessel and accumulates as a white snow at the bottom of the liquid hydrogen. When the outside of an ordinary test-tube is cooled by immersion in liquid hydrogen it soon fills up with solid air, and if the tube be now lifted out a double effect is visible, for liquid air is produced both in the inside and on the outside of the tube—in one case by the melting of solid air, in the other by direct condensation from the atmosphere.—*New York Sun*.

THE BREAKFAST-FOOD FAMILY.

John Spratt will eat no fat,
Nor will he touch the lean.
He scorns to eat of any meat;
He lives upon Foodine.

But Mrs. Spratt will none of that;
Foodine she cannot eat,
Her special wish is for a dish
Of Expurgated Wheat.

To William Spratt that food is flat
On which his mater dotes.
His favorite feed—his special need—
Is Eata Heapa Oats.

But Sister Lil can't see how Will
Can touch such tasteless food
As breakfast fare it can't compare,
She says, with Shredded Wood.

Now, none of these, Leander, please;
He feeds upon Bath Mitts.
While Sister Jane improves her brain
With Cero-Grapo-Grits.

Lycurgus votes for Father's Oats;
Proggine appeals to May;
The junior John subsists upon
Uneeda Bayla Hay.

Corrected Wheat for little Pete;
Flaked Pine for Dot; while "Bub,"
The infant Spratt, is waxing fat
On Battle Creek Near-Grub.

—Chicago Tribune.

PLASTER IMPRESSIONS.—Dr. E. Latzer and Dr. K. Weisl (*Oest.-ungar Vierteljahrs*) point out that the chief difficulty in obtaining good results from plaster impressions lies in their liability to fracture into many pieces and the difficulty of adapting the fragments. Take a tray, as nearly as possible the correct size, smear it over with vaselin, cover its surface with a piece of fine gauze, previously wetted, allowing this to project about 2 to 3 cm. beyond the margins of the tray, and proceed to fill the tray with plaster and to take the impression in the usual manner. The gauze used, a thin variety of tulle, has a meshwork of about one-twentieth of an inch in diameter. The gauze need not lie close to the tray and folds do not matter, as

the authors find that the gauze becomes embedded in plaster. When the plaster has set remove the tray and then remove the plaster impression with the gauze embedded therein, by pressing it down with the fingers introduced between it and the cheek. The impression is of course cracked, but the gauze holds the fragments together. The impression is then laid in the palm of the hand, the fragments bent back to allow the *débris* to be blown out from between the joints, which are then closed up, and the impression replaced in the tray and the model cast in the usual way.

 INDEX TO ADVERTISEMENTS.

American Cabinet Co.	66	Indiana Dental College	83
American Hard Rubber Co.	80	Invalid Appliance Co.	51
Antikamnia Chemical Co.	55	Jessen & Rosberg—Bench.	39
Antidolar Mfg. Co.—Anesthetic.	61	Johnson & Johnson—Specialties.	49
Atlas Dental Lab. Co.	62	Kershaw, B. H.—Toothache Drops.	28
Austin, Robt.—Specialties.	75	Klewe & Co.—Jenkins' Porcelain.	60
Baltimore College of Dental Surgery.	91	Knapp, H. C.—Ramesite Cement.	68
Barker, W. H.—Polishers.	62	Kress & Owen—Glyco-Thymoline. Cover	
Bennett, G. L.—Forceps.	63	Lambert Pharmacal Co.—Listerine.	1
Bradner, R. S.—Hull Disks.	34	Lavoris Chemical Co.	27
Brewster, R.—Porcelain.	56-59	Louisville Coll. of Dentistry.	81
Burke-White Co.—Ab-kon-ker.	29	McConnell, J. W.—Chair.	47
California Univ. Dental Dept.	83	McKesson & Robbins.	3
Carmo Supply Co.—Anesthetic.	48	Manhattan Dental Co.—Crown Pins.	83
Chicago College Dental Surgery.	88	Marion-Sims Dental College.	86
Chicago Post-Graduate Dental Coll.	26	Martin & Anson Co.—Air Pumps.	28
Cincinnati College Dental Surgery.	88	Medico-Chi. Dental College.	82
Clark, A. C., & Co.	52-53	Meler, D. M., Co.—Specialties.	50
Colorado College Dental Surgery.	83	Mills, R. Q.—Anesthetic.	28
Croselmire & Ackor—Platinum.	49	Michigan Univ. Dental College.	81
Dee, Thos. J., & Co.—Refiners.	70	Minn. Univ.—Coll. of Dentistry.	95
Dentacura Co.	2	Missouri Dental College.	90
Detroit Dental Mfg. Co.—Specialties.	64	Morgan-Maxfield—Disk Mandrel.	49
Dental Protective Supply Co.—		Morgan, Hastings & Co.—Gold Foil.	72
Angle Attachment.	20	Mutual Dental Supply Co.	41
Ductile Alloy.	19	Nelms, H., & Son—Gold.	77
Fellowship Alloy.	15	New York College of Dentistry.	89
Fellowship Burs.	6	New York Dental School.	94
Fellowship Cement.	11	Northwestern Univ.—Dental Dept.	92
Fellowship Teeth.	4	Oakland Chem. Co.—Hydrogen Dioxide.	3
Fellowship Oxyphosphate.	7	Odontunder—Anesthetic.	76
Fellowship Twist Broaches.	12	Ohio College of Dental Surgery.	90
Fellowship Broaches.	13	Oliver Mfg. Co.—Rolling Mills.	41
Fellowship Dental Engine.	14	Parke, Davis & Co.	5
Fellowship Handpiece.	8	Peck, A. E.—Inlay System.	74
Fellowship Lathe.	21	Penna. College of Dental Surgery.	93
Fellowship Automatic Mallet.	22	Perfection Bridge Co.—Bridge.	47
Fellowship Right Angle Mallet.	16	Phila. Optical Coll.	36
Fellowship Slip Joint.	17	Place, J. W.—Crown System.	76
Fellowship Cement, Spatula, etc.	24	Polk, R. L.—Register.	33
Mouth Mirrors.	10	Roach, F. E.—Wedglock Facing.	38
Repair Work.	18	Rutherford, A. S.—Specialties.	61
Rubber Dam.	28	Sams, W.—Blowpipe.	73
Dental Specialty Co.—Denver.	48	Sanitol Co.—Sanitol.	2
Electro Mfg. Co.—Battery.	40	Saranac Electric Co.	79
Fischer, H., & Co.	28	Scharmann, G.—Cement and Burs.	65
Fisher, John C.—Crown System.	30	Schering & Glatz—Eucaln.	27
Florence Mfg. Co.—Tooth Brushes.	96	Seattle D. S. Co.—Swager.	34
Franco-American Chem. Works.	30	Sims Hydraulic Engine Co.	60
Georgetown Univ.—Dental Dept.	93	Smith-Premier Typewriter.	36
Gesswein, F. W., Co.—Ruby Crystal.	33	So. Calif. Univ. Coll. of Dentistry.	95
Glon-o-caline Mfg. Co.—Glon-o-caline.	20	Sprague, J. A., & Co.—Pustolene.	40
Goldsmith Bros.—Refiners.	42-45	Star Specialty Co.	61
Goodrich, B. F., Co.—Rubber.	82	Superior Strip Co.	40
Graves, E. L.—Tooth Powder.	Cover	Teague D. S. Co.—Specialties.	78
Green, L. O.—Acestoria.	71	Tuller, R. B.—Instrument.	46
Griswold, D. B., Co.—Bridge.	36	Turner Brass Works—Furnaces.	54
Hall, Wm. R., & Son—Specialties.	74	Twist, Dr. J. F.—Crowning Outfit.	37
Hare & Stephens—Props.	35	Union Dental Mfg. Co.—Idicium.	37
Harvard University—Dental Dept.	95	Wants, For Sale, etc.	29
Hisey, D. M., Co.—Alvatunder.	47	Willson, H. B.—Patents.	27
Howard, C. T.—Strips.	33	Webster Dental Co.—Splitfoam.	87
Illinois University—Dental Col.	84-85	Western Reserv. Univ.—Coll. of Dent.	95